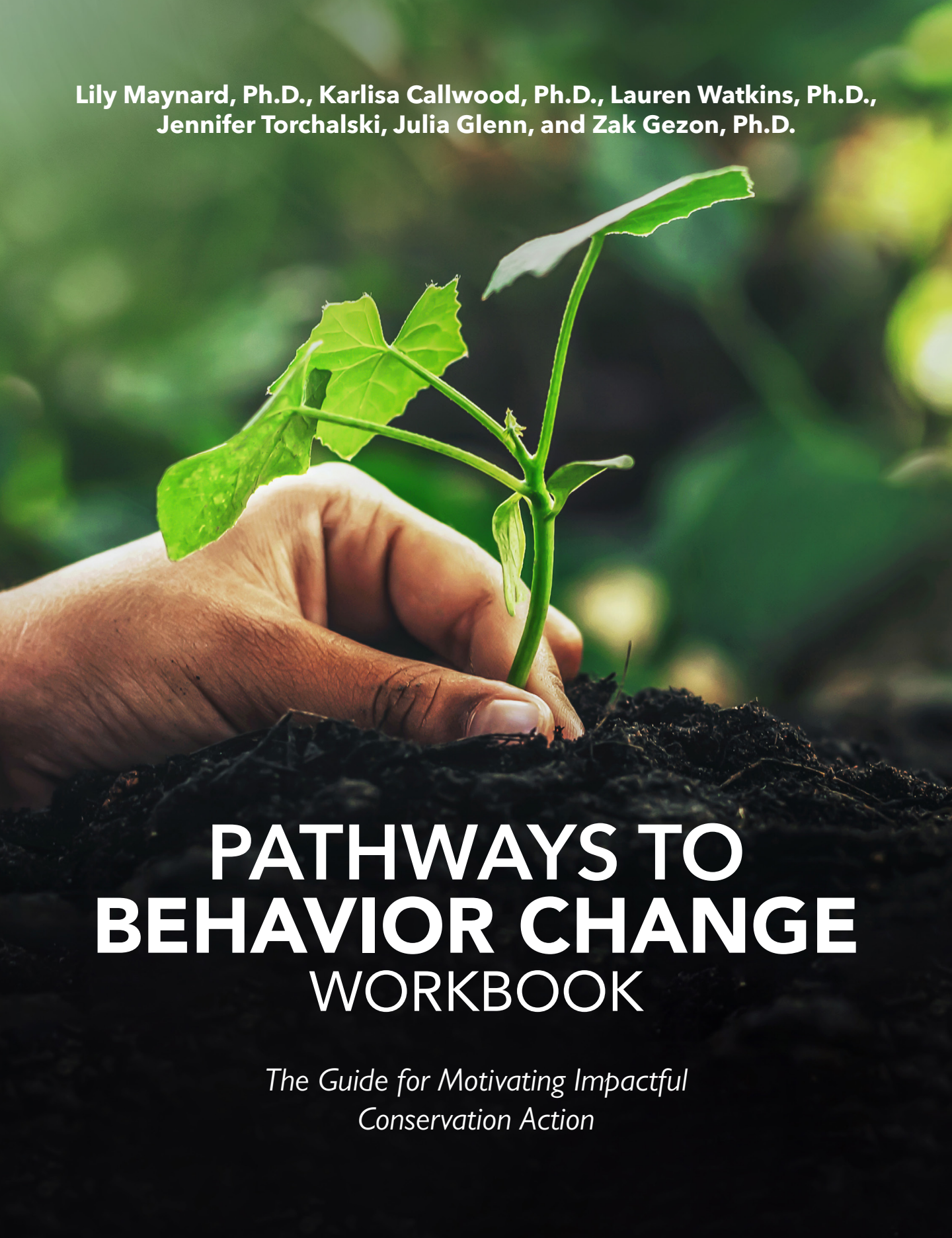


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Jennifer Torchalski, Julia Glenn, and Zak Gezon, Ph.D.

A close-up photograph of a person's hand gently placing a small, vibrant green seedling into a mound of dark, rich soil. The seedling has several leaves, some of which show signs of being eaten by insects. The background is a soft-focus green, suggesting a garden or natural setting. The overall tone is hopeful and nurturing.

PATHWAYS TO BEHAVIOR CHANGE WORKBOOK

*The Guide for Motivating Impactful
Conservation Action*

PATHWAYS TO **BEHAVIOR CHANGE** WORKBOOK

*The Guide for Motivating Impactful
Conservation Action*

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Disclaimer: Some of the content included may not represent the views of the contributing authors, their organizations, or their donors who may have supported elements of this work. Case studies and examples throughout the document are cited to provide reference to additional resources that can be explored for more information. Citations in this workbook are based on the authors' and expert reviewers' assessment of the resources, but do not indicate direct approval or involvement of those authors in this synthesis



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FORWARD

Jackie Ogden, Ph.D.

Retired Vice President of Animals, Science & Environment for Walt Disney Parks & Resorts

We are in a tough place on our planet. We know that we are facing the sixth greatest extinction. We know that we are already feeling the impact of global climate change, and that it is likely too late to avert significant impact to our planet, even if we were to immediately take significant steps. Many experts – from climate scientists to economists to policy wonks – believe that we are on the precipice of a growing crisis: from food and water, to energy, to social equity, to extinction to economics.

I have been thinking about whether public-facing organizations whose missions touch on conservation are doing enough? Although it pains me to say so, my answer clearly is no.

This workbook has the chance to help.

Within the past decade, conservation organizations have been (finally?) recognizing that conservation is about people. At the risk of being snarky, protected areas will only work if people honor them. And I recognize the importance of policy is great, but it may not solve our problems – especially if the policies don't meet people's needs. As Lily Maynard, one of the authors of this book says, "Conservation is an active verb, and people are the only species that can do it."

As conservation organizations that reach the public, the role of zoos and aquariums should be clear. Yes, direct field conservation is critical. Yes, environmental sustainability is critical. Yes, government advocacy is critical. But WE HAVE GUESTS. We are arguably the only conservation organization that can so directly reach people.

When you look at accredited zoos and aquariums within the AZA, that translates into roughly 200 m people a year. When you look at the responsible zoos and aquariums that are part of WAZA, it's perhaps 600m a year. Wow. Every traditional conservation organization I know would kill for this opportunity.

Accredited and responsible zoos and aquariums have wonderful education programs - for school children, and for zoo and aquarium visitors. We have (largely) graduated from a focus on natural history facts to a focus on concepts/understanding and on empathy/affect. There is evidence for the ability to we have to create empathy, to build understanding, to even create incremental behavior change. This is so great, and I don't want to diminish it.

But are we reaching our potential? Nah.

Imagine (as I know many of our education/engagement/marketing/policy people do) if we could identify the key behaviors we want to change, agree on them, and together implement programs that capitalize on our animals and empathy, that then specifically target particular outcomes? Especially outcomes that are

particularly relevant to the changes we want to see in our society? And if we did that TOGETHER? Oh my.

It is clear that we are not reaching the potential that befits such organizations. It is clear that significant changes are required. Incremental changes will no longer work – we require system changes to be effective.

To do this, we must learn how to reach our guests. We must learn how to create empathy for our animals. And we must learn how to actually impact behavior. To impact behavior that actually – ideally – leads to reducing the impact on a particular species.

This work is complicated. I have a PhD and I have not read all the primary literature in this area. Especially since – yea! – it keeps growing. Nor do I have the bandwidth to think about how all this literature builds together to help me figure out how to develop programs or experiences that will get me what I want to do.

This workbook is the first fully-developed resource that provides practitioners with both the theory and the tools. There are training programs from some of the leaders in this world (thank you, Zoos Victoria). But there are no practical tools such as this that are available to practitioners – that simplifies and explains the theories, but focuses on how to actually do this.

I applaud the authors for putting this together. For most of my career, I have been espousing the value of behavior change, and the importance of focusing on this within our organizations. But as anybody who has tried to stop eating chocolate knows, behavior change is HARD. Success depends on so many things, and this book does a phenomenal job of helping people put these tools into practice.

The book is intended to be a work in progress, meaning that it will constantly evolve. Which is great as we hopefully will be seeing a flood of research and evaluation using these tools.

I applaud the authors for this work, and wish I had had it early on. I think ideally it would be used as a guide for a group – a department, a class – but certainly could work for a dedicated individual as well.

My hope is that this work – and other trainings that are under development – will help our engagement experts in working to change the conservation-related behaviors of our zoo and aquarium guests (or museums, or botanical gardens). This work is so critical to our future. Without influencing the behavior of people – whether in Cleveland or in Kenya -- - we will not be able to affect the serious issues facing us from a conservation perspective.

PREFACE

WHY A WORKBOOK?

This workbook is written for you and your team's conservation goals. We built this guide using best practices in social science and conservation planning. Not only do we introduce key theories and approaches to conservation messaging, we also help you **apply** them to your work. Whether you're developing a wildlife conservation project within your organization or encouraging your neighbors to care about the local landscape, this workbook provides the tools, resources, and strategies to make your communication plan a success.

While we offer an introduction to conservation messaging and relevant conservation psychology theories, this is not an exhaustive resource. We encourage you to explore the references provided to dive deeper into topics most relevant to your goals. Conservation is complicated, and the more people involved, the more diverse messages tested, the more effectively we can engage a wide range of audiences. This workbook is your guide.

To get the most out of it, use this workbook actively: write in it, brainstorm ideas, and test different approaches. Share it with a friend or colleague and collaborate on creating impactful messages. Evaluate your successes, then return to refine your techniques as you continue developing your conservation messaging strategies.



Your Journey to Conservation Planning

This workbook will walk you step-by-step through creating a conservation plan. We'll begin by grounding you in conservation behavior; then guide you through your own project. You'll identify your conservation goals, choose a target behavior, define your audience, and select a behavior change model to apply. By the end, you'll have a conservation plan ready to begin implementing.

Have you already completed some of these steps? Great! Then start with the section where you need the most guidance and go from there.

Keep an eye out for activities, checklists, examples, and guides to support you in building a successful conservation behavior change campaign.



Sightseeing on Your Journey

Throughout this workbook, you'll find “rest stops” and opportunities for sightseeing. Rest stops are side notes that offer additional depth and considerations for developing your project plan. Take a moment at each one to reflect on how the ideas apply to your engagement program design.

Overall, this workbook is meant to guide you through designing a conservation behavior change project. Through education, exercises, and creative thinking, we hope you finish your journey equipped with the key to communicate effectively with your audience.

Let's get started!





PART ONE

UNDERSTANDING THE STRATEGIES

CONTENTS

Awareness vs. engagement

Activity: Identifying strategies

Key terms

Thinking differently: Reframing conversation

Exercise: Reframing messages

Awareness vs. Engagement

Oftentimes, the terms “awareness” and “engagement” are used interchangeably in conservation efforts, but they are not the same. Awareness describes when an audience is well-informed about or have knowledge of a particular situation. That awareness may come from learning experiences, interactions with researchers, educators, and conservationists, or personal observations. However, engagement refers to the active involvement of an audience in actions that will contribute to conservation. It’s important to understand how you intend to reach your target audience and which approach you will utilize. And keep in mind that while each of these approaches can be used individually, they are not mutually exclusive. Although awareness by itself does not equal engagement, awareness can help lead to engagement.

	Awareness	Engagement
Definition	Knowledge or perception of a situation or fact; concern about and well-informed interest in a particular situation or development “a growing environmental awareness”	The active involvement of local community or audiences in actions that will achieve conservation solutions
Example	Creating a social media post highlighting impacts to corals	Training and inviting recreational divers to create and maintain coral nurseries

Differences between awareness and engagement strategies

Building on this distinction, it is crucial to recognize that while raising awareness is a foundational step, true conservation impact often hinges on how effectively this awareness translates into active participation. Strategies to foster engagement should be designed to motivate individuals beyond mere knowledge acquisition. For example, providing opportunities for hands-on involvement, such as volunteering for clean-up events or participating in community science projects, can bridge the gap between understanding and action. Tailoring these engagement opportunities to resonate with the specific interests and values of the target audience enhances their likelihood of taking meaningful action (more on that in Part 5 of this workbook!). Thus, integrating awareness-building with interactive and participatory elements ensures that the conservation message not only reaches the audience but also inspires them to become active contributors to the cause.



ACTIVITY: Identifying strategies

Using what you've learned, review the following examples and identify if they are facilitating awareness or engagement within an audience. Answers are at the end of this section.

Example	Awareness	Engagement
1. Celebrating international okapi day at your facility		
2. An onsite energy reduction campaign at your facility		
3. Zoo teens building bee home for placement in the field		
4. Selling animal art at your facility to fund conservation efforts abroad		
5. Providing curriculum about rhinos for school partners		
6. Citizen science and habitat restoration projects for amphibians		
7. Creating a community soccer program in Madagascar to support radiated tortoises		
8. A fundraiser to support rangers working hard to prevent poaching		
9. Encouraging people to participate in community science by identifying animals in camera trap photos, helping conservationists monitor populations		
10. A community-based art co-op that sells its art to tourists to provide income for the village instead of using forest resources to support the community		

Key Terms & Definitions

The following terms will be helpful as you move through this workbook:

Accessible wording refers to language that is clear, straightforward, and easy to understand for a broad audience. The goal is to ensure that the text is comprehensible to people with varying levels of literacy, cognitive abilities, and language proficiency. Some tips include: simple vocabulary, short sentences, and inclusive language when considering diverse audiences' perspectives.

In communications, **framing** refers to the way information is presented or structured to influence how it is interpreted and understood by an audience. It involves selecting certain aspects of a topic while emphasizing specific elements and downplaying others to shape perception and guide interpretation. Organizations, media, and policymakers use framing strategically to align information with their goals, values, and objectives, aiming to persuade or inform their audience in a specific way.

Additionally, **reframing** refers to the process of changing the way information, issues, or situations are presented to alter perception and understanding. This involves shifting the perspective or context of a message to help an audience view it differently.

Social marketing is a strategic approach used to promote behaviors that benefit individuals and society by applying marketing principles and techniques to influence and change social behaviors. Unlike traditional marketing, which focuses on selling products or services, social marketing aims to achieve positive social outcomes by addressing various social, health, or environmental issues.

Audience motivations refer to the underlying reasons or drives that influence why a particular audience engages with, responds to, or is interested in a specific message, product, or content. Understanding audience motivations is crucial for effective communication, marketing, and engagement strategies.

Audience perspectives refer to the unique viewpoints, beliefs, and attitudes that individuals or groups bring to their interpretation of messages, content, or situations.

Behavior change refers to the process of altering an individual's or group's actions, habits, or practices to achieve a desired outcome or improve a particular aspect of life.

Target Behaviors highlight the specific actions you want your audience to adopt, change, or stop. These behaviors should be clearly defined, measurable, and realistic so that progress can be tracked over time. Identifying a target behavior helps focus your messaging and ensures that your conservation efforts are actionable and outcome-oriented.

A **target audience** refers to a specific group of individuals or organizations that a message, product, or service is intended to reach or influence. This group is defined based on shared characteristics, needs, or interests that make them the ideal recipients for a particular communication or offering. Defining a target audience can be based on demographics, perspectives and psychological traits, geographic location, behaviors, current needs, media consumption habits, and more.

A **behavior change model** is a theoretical framework that outlines how and why individuals or groups alter their behaviors. These models provide structured approaches for understanding the processes behind behavior change and for designing effective interventions to encourage positive changes.

Conservation and/or Pro-environmental behaviors refers to actions and practices undertaken by individuals or groups aimed at protecting, preserving, and managing natural resources, wildlife, and the environment.

Thinking differently: Reframing conversations

Many are beginning to recognize that conservation efforts don't need to focus solely on increasing awareness or public concern. Today's approaches aim to shift attitudes, build knowledge, and frame messages in ways that inspire pro-environmental behaviors. Reframing conservation from "what you should know" to "what you can do" encourages immediate action while supporting lasting impact.

Additionally, framing messages more positively and reducing blame, focusing on specific species or issues, and breaking large challenges into smaller, more achievable steps, helps audiences feel that their contributions are both realistic and meaningful.

ACTIVITY: Reframing messages

Reframing not only makes conservation efforts more relatable but also empowers individuals by emphasizing actionable steps they can take rather than overwhelming them with complex issues. By presenting conservation in terms of manageable actions and tangible benefits, individuals are more likely to feel that their contributions make a difference. Positive framing can shift the narrative from a sense of helplessness to one of agency and effectiveness. Furthermore, celebrating small successes and providing feedback on the impact of individual actions can reinforce commitment and encourage ongoing participation. By making conservation practical and achievable, reframing strategies help build a motivated community ready to participate in pro-environmental stewardship.

Write a short phrase to describe a conservation scenario you are working to address:

Understanding how we think: Negative and positive explanatory styles

Consciously rewriting issues can bring to light new opportunities for successfully communicating to your audience. Such innovation can boost a conservationist's impact and promote increased awareness of an issue, as well as achieving the spread of pro-conservation behaviors. From social marketing targeting specific behavioral solutions, to campaigns to increase environmental activism, reframing a message can greatly augment conservation communication's efficacy.

When trying to understand a problem, there are two types of thinking patterns people can fall into: negative explanatory styles and positive explanatory styles. These tend to be people with pessimistic thought patterns and optimistic thought patterns, respectively. People who think in negative explanatory styles frame a

problem with negative language and tend to view it as too permanent, too big or pervasive, and too personal. This creates feelings of overwhelm and exhaustion; it doesn't lead to solutions. Take a look at the situation below:

"It's too hard to get in shape. I don't know where to start or what exercises to do."

The above situation feels overwhelming. The way it's written, it seems like a pervasive problem and it puts pressure on the individual for not having the right knowledge or resources to solve it all at once. If we're being honest with ourselves as conservationists, sometimes we frame environmental issues like this - making the problem too big without real, tangible solutions.

Reviewing your first description of the conservation scenario you are working to address, did you use a negative or positive explanatory style? What words make it so?

Purposefully rethinking to be more positive:

The beautiful thing about thoughts is that humans can change them. Consciously rewriting, or reframing, how your brain interprets problems is the key to success. Reframing a situation can help someone shift their understanding of an issue and see it as temporary (rather than permanent), local enough to be tangible (rather than a "bigger than us all" mentality), and collaborative (rather than relying on solely them). Let's take our example from before and reframe it:

"I care about being healthy. Next time I have a few minutes, I can look online or ask a friend for help picking one exercise, or one exercise routine, that I can do this week."

This shift in wording removes some of the permanence of the situation by creating a smaller, more approachable goal. It helps individuals focus on gaining knowledge and building a plan, rather than feeling like they already need to have all the answers. When you reframe a thought, it becomes less menacing. It doesn't make the situation stress-free, but it does make it more manageable.

In the same way, consider how conservation messages can be reframed from daunting, large-scale problems into achievable steps:

Example	Awareness
It's a problem	It's an opportunity to learn how we can make things work better.
We don't have enough resources	Let's make sure we understand how to capitalize on the resources we have.
We don't have enough time to save all threatened species.	Let's decide which species to focus on now and which to address later.
Stopping all carbon emissions is unachievable.	Let's break down reducing carbon emissions into realistic steps.
We need to get more community involvement.	We can build on community involvement by learning who is already interested in us and how they like to help
We are losing thousands of species of wildlife every year.	We have the chance to save animals, and by doing so we can help protect many other species in the same places

Trade this with a partner to rewrite your original problem statement using active and engaging frames. Remember to emphasize accessible wording, reframing using motivations and audience interests, and/or possible solutions.

Awareness / Engagement Exercise Answers:

Awareness: 1, 5, 7

Engagement: 2,3,4,6,8,9,10

UNDERSTANDING THE STRATEGIES

Chapter Summary: Your Final Thoughts

In the spaces below, reflect about your takeaways from this section as they relate to your project or campaign. How can you better focus on audience engagement rather than awareness? How can you reframe your messages to be more positive and proactive? What new discussions can you have with your partners and team members?



PART TWO

IDENTIFYING YOUR GOALS

CONTENTS

Defining your project

The five whys

Aspirational and operational goals

Brainstorming behavioral opportunities

Example: Goals and strategies

Activity: Knowing your audience

Defining Your Project

What are you working to conserve?

You may have heard the phrase that the hardest step in solving a problem is admitting you have one. In conservation, one of the most challenging steps is clearly defining the problem and understanding everything that contributes to it. Who are the key players? What are the actual threats?

By identifying and understanding these threats, we can better determine where to focus first and how to view conservation issues through more targeted and effective lenses.

Common threats to our species and ecosystems

Review the table below for a list of most common threats harming our wildlife and ecosystems, and the actions one could suggest to help mitigate these threats. Think about the conservation issue you and your team are working to solve. Check off the boxes of the threats you think are most relevant to your cause (stick to the few largest threats; targeting too many at once can lead to ill-defined project boundaries.)

Threat	Is this threat relevant to your project?	Example actions that might help address this problem
Pollution		Consume fewer products and fix / reuse belongings
Agriculture & aquaculture		Farmers: Reduce pesticide and fertilizer use by adopting sustainable alternatives
Use of natural resources & wildlife trade		Businesses replace supply of illegal wildlife products with sustainable alternatives; consumers / tourists demand sustainable products without wildlife parts
Climate change & severe weather		Foresters and landowners: comply with sustainable land management to protect and restore forests for carbon sequestration
Energy production & mining		Businesses: comply with legislation about environmentally friendly practices
Human disturbance & modifications		Minimize human disturbance and development impacting ecosystems; Make protected areas & "no-take zones" for habitats to adapt and support healthy populations
Residential & commercial development		Adopt sustainable land use methods and development best practices
Transportation & service corridors		Limit development to non-sensitive habitats or those that are home to critical species
Disease & population genetics		Respond to disease events to prevent spread and protect populations
Invasive species		Restore healthy habitats by removing invasive species

List of threats cited from Kapos et al. 2008; Salafsky et al. 2008; Rare 2019

Defining the conservation issue you want to address, and the complexities within it, will help set you up for success. Goals should be specific enough to focus on manageable components. See the next page to begin defining your organization's goals.

Identifying Your Goals

Create clear definitions to set yourself up for success

Now that we are open to reframing our conservation messages and activation strategies to reach audiences and inspire engagement, let's start with your specific project. Think about a conservation project you are currently working on or would like to implement. You will use this project as we go through this workbook.

Your conservation project name:

Location (country, region, state, city):

What is the issue / species / ecosystem you are currently working to conserve?

What are the conservation issues / threats to the species or ecosystem? See the table of common threats on the previous page and elaborate on why you chose those threats.

The Five Whys

Need help defining the root of your issue?

The 5 Whys is an iterative interrogative technique you can use to explore the cause-and-effect relationships underlying a particular problem, leading to the problem's root cause. Each answer will form the basis of the next question.

WHAT is your conservation problem?

WHY is it happening?

WHY is that?

WHY is that?

WHY is that?

WHY is that?

EXAMPLE: The Five Whys*from the Conservation Planning Specialist Group (Copsey, 2019)***WHAT** is your conservation problem?*Cycads from Guam. Abundant in the 1990s, current and future generations are projected to decline by up to 50%***WHY** is it happening?*Adult plant mortality is high and juvenile recruitment is low***WHY** is that?*Leaves of the plants are in poor health and fail to regenerate***WHY** is that?*There is evidence of invertebrate damage to the leaves and stem of the plants***WHY** is that?*One population of cycads in the North of the island declined from 686 individuals in 2004 (before an introduced scale mite reached them) to 87 in 2007***WHY** is that?*...into the reasons for the introduction of the mite!*

PART TWO: IDENTIFYING YOUR GOALS

Aspirational and operational goals

Aspirational goals are high-level, visionary targets that reflect long-term ambitions and ideal outcomes. They are often broad, ambitious, and inspirational, designed to motivate and guide an organization or individual towards achieving a significant vision or purpose.

Operational goals are specific, actionable objectives that are designed to achieve the broader aspirational goals. They are focused on short to medium-term outcomes and are often used to guide daily activities and measure progress.

Aspirational Goals:

In 10 years, your project has been implemented successfully and the species / ecosystem is in a much different situation. Describe what that situation looks like:

Operational Goals:

In 10 years, your successful project was implemented with all of the creative strategies and stakeholders necessary to complete the effort. Describe what these strategies might look like to get you to this point:

Now let's dig into behaviors. Humans are the only species that can actually do conservation! Conservation behaviors are those activities that reduce threats to wildlife or ecosystems or support a sustainable society.

Is there an opportunity for human behaviors to impact the threats you identified in the previous section? (Hint: almost every conservation threat has a human driver, so yes!)

☐ YES!

☐ NO

Brainstorming behavioral opportunities

If you checked YES on the previous page, it's time to get some brainstorming in action. Use the diagram below to think about the different players and behaviors that can go into getting a solution to your conservation behavior issue:

Who may be involved in causing the problem?

Who could help to stop the problem?

To reduce the problem, what actions could we START?

To reduce the problem, what actions could we STOP?

Which of these might help you achieve your aspirational and operational goals? Circle or place a star around those behavioral opportunities.

PART TWO: IDENTIFYING YOUR GOALS

You'll want to focus on one behavior at a time. By asking your audience to do one action, they will avoid being overwhelmed by too many choices. When there are too many options, people may feel their easiest path is to choose to do none. This is often called "decision paralysis" (Schwartz 2004).

What specific behavior will you plan to start with?

Based on your ideas, what do you hope to achieve through Conservation Behavior Change?



EXAMPLE: Goals and Strategies*Protecting Cotton-Top Tamarins with Proyecto Titi*

This will be a thinking exercise to get as specific as possible about what the problem is, how it can be solved, and who they need to get on board to solve it. Often, organization missions are high-level and do not address specifics.

State the organization's mission:

"Proyecto Titi works with local communities to protect the critically endangered cotton-top tamarin, a tiny, one pound monkey that is only found in the tropical dry forests of Colombia. Through scientific studies, public education and economic alternatives, we are helping to protect cotton-top tamarins and their habitat."



What is the biggest threat to your animal?

Habitat pollution

Specifically, what is the biggest source of habitat pollution?

Plastic bags in the environment

Where does it come from?

People disposing of plastic bags improperly

Who participates in it?

Local community members buying groceries

What can one member of that group do today to not contribute to that problem?

A person going to the store could use a reusable bag.





PART THREE

SELECTING YOUR TARGET BEHAVIOR

CONTENTS

Positive over negative

Illicit behaviors

Behavior options menu

Opportunities for new target behaviors

Activity: Describing a new behavior and possible audiences

What is conservation behavior change?

In today's world, people are busy. They're focused on living their lives and prioritizing what—and who—matters most. The values they hold guide the decisions they make every day.

At the same time, many factors influence their ability to choose conservation behaviors. When did they wake up? What are they eating for lunch, and how will they get it? Who are they responsible for? How much flexibility do they have in their time?

Every action people take reflects a combination of what matters most to them and the constraints they face. Our goal is to understand diverse audiences and reach them in ways that feel relevant and meaningful. We want you to be able to tell the powerful stories of your conservation work and inspire others to take part in your efforts.



Rest Stop: Positive over negative frames

Positive framing is often more effective than negative framing. Psychologically, saying "don't do that" tends to be less effective than saying "do this"—so provide positive alternatives whenever possible.

Example: Proyecto Tití developed a community-based social marketing and education program called Amiguau. Rather than telling people "don't keep cotton-top tamarins as pets," they promote an alternative: local dogs. By teaching youth how to train dogs that need care and attention, participants build meaningful connections and learn that dogs are intelligent companions—while also understanding that wild tamarins belong in the wild. This creates a win-win through positive framing and hands-on learning.

Positive, empowering messages are more likely to inspire action than those focused solely on crisis and doom (Wright et al. 2015).

Conservation is an active choice people make every day, in ways that fit their lives and priorities. Addressing specific threats to wildlife often requires behavior change, which can be supported through social marketing techniques designed to encourage desired actions (Monroe 2003). Behavior change advocacy is also an increasing focus of conservation education and environmental literacy programs (Heimlich & Ardoin 2008). Effective strategies for encouraging behavior change include identifying what information to provide to specific audiences, tailoring messages to resonate with those audiences, and inspiring and sustaining long-term commitment (Monroe 2003).

"Conservation is a behavioral challenge and therefore needs behaviorally informed solutions." (Rare 2019)

In one research study, expert conservationists and zoo visitors differed in how they viewed opportunities to address conservation threats. Experts tended to focus on the roles of governments and corporations, while the public emphasized individual actions. Despite these differences, both groups agreed that individual actions can contribute to addressing global conservation challenges (MacDonald, Milfont, & Gavin 2015). The next step is to help guide people toward taking those actions!





Rest Stop: Illicit behaviors are complicated

Illicit behaviors are hard to talk about or survey people about.

If you ask someone if they break the rules or hunted for wildlife, should we expect them to be honest? Probably not if they are at all worried about retaliation.

Monitoring non-compliance with environmental and wildlife protection laws is a difficult process to accurately measure (Solomon, Gavin, & Gore 2015). In some scenarios, you might be able to monitor the wildlife directly to record illegal poaching events. But in others, you might need to survey and talk to people to indirectly measure the behavior. Researchers have created methods for allowing people to be honest without connecting their name to the illegal resource use. For example, Solomon et al. (2007) developed a randomized response technique to use dice during an interview to guide the interviewees to speak honestly about their bushmeat consumption without the interviewer recording the data directly. This study found a significantly higher rate of wild meat consumption than surveys that directly asked people about what they consume (Solomon et al. 2007).

Behavior options menu

Here are some example behavior types that are often promoted in behavior change campaigns: (See definitions of behavior types on the next page.)



Conservation behaviors you can choose

The following table is a classification of conservation behavior change strategies as published in Maynard et al. (2020). These categories of behavior types add to the conservation planning framework of Salafsky et al. (2008) with categories from Stern (2000), including 12 behavior types in 5 categories.

Check the behavioral categories that are relevant in reducing the threat to your species/ecosystem:

Level	Conservation Behaviors by Level of Classification	Definition	Check all that apply to your project:
	Environmental activism conservation behaviors	Recruitment and activist behaviors in the public sphere	
1.1	Spreading information	Spreading information about the project or issue with personal networks / using technology (e.g. social media)	
1.2	Recruiting others	Recruiting friends, family, and/or close connections for joint action in the conservation behavior or the project.	
1.3	Joining a partner organization	Participating in the project by joining in with another organization's efforts on the project, becoming a member, or donating to their role in the cause.	
1.4	Political advocacy	Supporting policies/law, petition signing, contacting politicians for conservation issues.	
	Non-activist behaviors in the public sphere	Engaging in conservation behaviors in the public sphere	
2.1	Using new learning resources	Engaging with the issue by learning more, exploring additional resources and websites, signing up for listserv and taking other opportunities to learn about issue	
2.2	Environmental stewardship	Supporting environmentalism with positive attitudes and a sense of responsibility that influences public actions	
	Private-sphere conservation behaviors	Individuals' private consumption and waste behaviors	
3.1	Resource sustainability	Reduce, Reuse, Recycle; Reducing waste, diverting to recycling, and maintaining household equipment.	
3.2	Sustainable purchases	Sustainable consumer purchases and cause marketing.	
	Conservation behaviors direct to the subject	Actions that the public can participate in which directly connect to the species or project	
4.1	Citizen science	Citizen science with direct observation of the species or habitat to record helpful scientific data	
4.2	Resource collection	Collecting materials or resources needed for the project	
	Pro-organization conservation behaviors	Behaviors that support the conservation organizations' efforts for the project	
5.1	Philanthropic funding	Donating to the organization for the project or species	
5.2	Volunteering	Volunteering at the organization to support the project	

Reflect on which of these conservation issues you chose. Are there any that would be more impactful than others for your particular cause? Oftentimes, we feel like we want to tackle each solution at the same time, but this way of thinking could create confusion and burnout for your audience. With many successful conservation projects, they work to tackle specific scenarios with specific groups of relevant people, rather than spreading responsibility and action across the board. In the next section, answer target behavior questions keeping your one or two top conservation behaviors in mind.

Are there any new behaviors you see as opportunities for reducing threats and increasing active conservation engagement? Write in the behavior(s) you checked on the previous page which might have the highest impact for your goals.

Describe in detail what people could actively do to support conservation efforts for this species/ecosystem:

Can anyone in the public do this behavior? Or is the behavior focused on specific communities or regional audiences?



PART FOUR

AUDIENCES FOR YOUR PROJECT

CONTENTS

Mapping target audiences

Assessing your target audience

Getting to know your audience

Activity: Knowing your audience

Audiences for Your Project

Who are the people you are trying to reach?

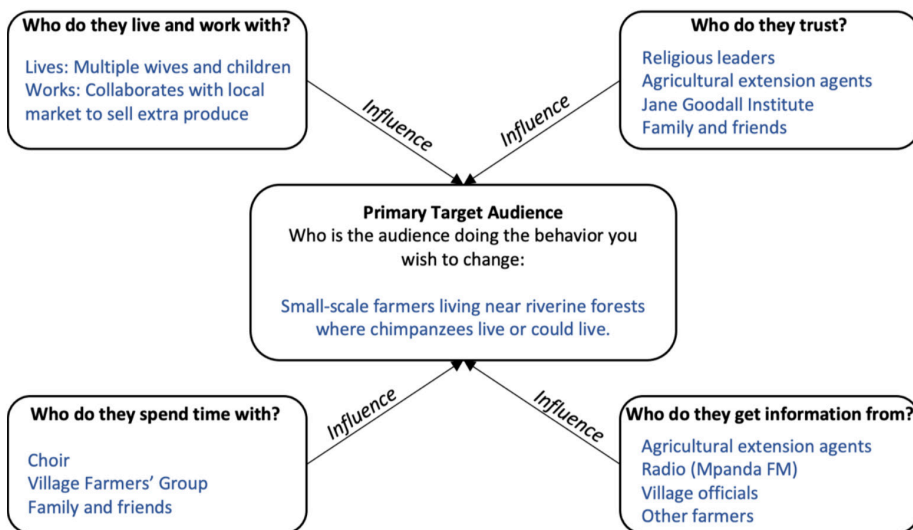
Now that you've explored which behavior you'd like to target, it's time to identify the audiences involved. This includes your primary audience, or those currently engaging in the behavior, as well as the audiences that may influence their actions.

For example, the Jane Goodall Institute implemented a behavior change campaign in western Tanzania aimed at slowing deforestation in chimpanzee habitat caused by small-scale farming in riverine forests. Farmers were expanding into these forests due to low soil fertility on their existing farms or in designated agricultural areas. The primary target audience for the campaign was small-scale farmers growing food for personal consumption or for sale. However, their behavior is shaped by trusted and influential people in their communities. As a result, the campaign also included strategies to increase positive attitudes toward the behavior change intervention, composting, among children, village officials, and agro-dealers in town.

Mapping target audiences

Using the example map below, map out your primary target audience on the following page—the group currently engaging in the behavior you want to change—as well as the audiences that influence them. If you're unsure about certain groups, it's okay to leave those spaces blank.

The example below from a project in western Tanzania led by the Jane Goodall Institute and Impact by Design highlights a target audience contributing to chimpanzee habitat destruction and identifies opportunities to engage them through education programs on composting.



Assessing your target audience

Collecting information about your target audience is essential for developing effective strategies. The more we understand our audience, the more we reduce risk and avoid relying on assumptions about their behaviors and decision-making.

You can gather this information in a variety of ways, such as interviews, focus groups, observations, or surveys. The method you choose will depend on your available resources and whether you are the most appropriate person to engage with the community. In some cases, it may be more effective and appropriate for someone within the target audience's community or culture to support or lead the data collection process.

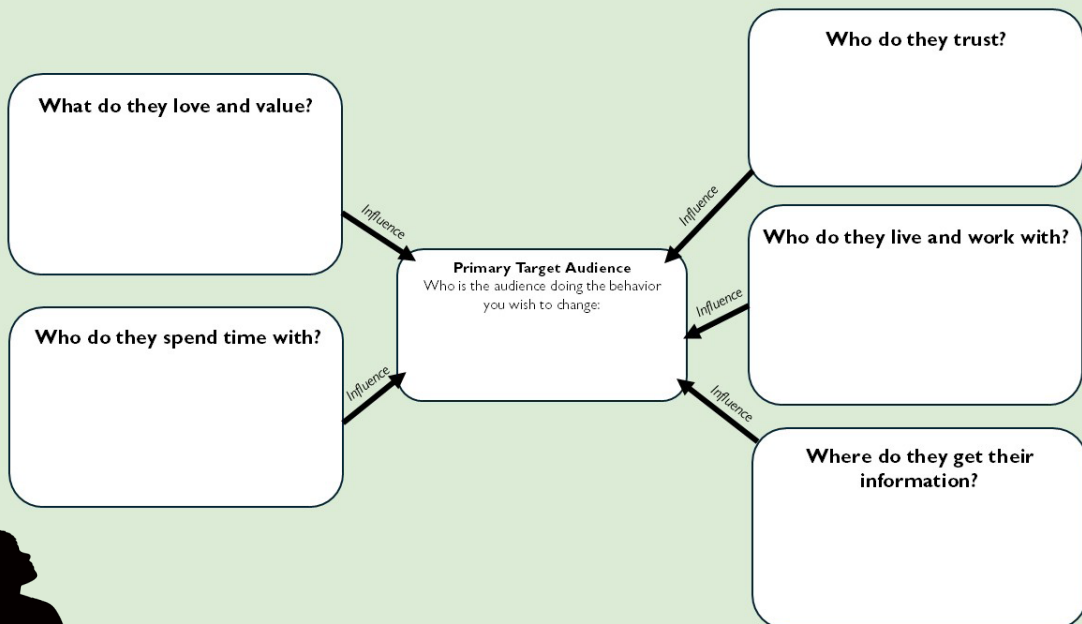
Getting to know your audience

Once you've identified your audiences, it is time to get to know who they are. Messaging and strategies for your behavior change initiative should be tailored to your target audiences, and the more you know about them, the better you can create impactful strategies. We need to understand what they care about, how they spend their time, and what motivates them. The most effective way to get that information is through data collection before you design your campaign.

A **target audience** is defined using a specific set of values and interests, including demographics, geographic segmentation, behaviors, political values, social status and other variables determined by the required context. An ideal target audience is made of decision-makers and/or influencers, who will ultimately be in charge of fulfilling the call to action. (Wright et al. 2015, p. 41).

ACTIVITY: Building Your Audience

Using the blank map below, build out what someone in your target audience may be like. Try to get creative and think from their shoes.



PART FOUR: AUDIENCES FOR YOUR PROJECT

Example audience assessment including characteristics and implications for a campaign engaging a community in China around forest conservation:

Target audience	Characteristics	Implications for the campaign
Wives	Age 15-50, married with children, primarily cook for the family and gather firewood, Muslim, literate in Mandarin	Use messaging that is family-oriented and focuses on family health, campaign should be written in Mandarin
Husbands	Age 18-45, married with children, work in local rice farms for income, Muslim, literate in Mandarin	Will need to access men in leadership positions to spread messaging, consider Islamic centers for messaging
Older children	Age 6-15, help wives with firewood collection and cooking, semi-literate in Mandarin, enjoy football	Use graphics and symbols for kids that cannot read, incorporate education into football games

Consider the target audiences you listed on page 37. Below, describe what you already know about these groups, as well as what additional information would be helpful to learn when designing your campaign.

Target audience	What do you know?	What else do you need to know?	Implications for the campaign

ACTIVITY: The Jane Goodall Institute Campaign

As you know by now, understanding audience characteristics and motivations is crucial for designing effective behavior change campaigns, as it allows for tailoring messages and strategies to resonate with the specific needs and values of the target group. By analyzing factors such as demographics, psychographics, and personal interests, campaigns can address relevant concerns and provide actionable solutions that align with the audience's goals. This targeted approach increases the likelihood of engaging the audience and fostering meaningful behavior changes, leading to more successful outcomes in achieving campaign objectives.

Fill out the table below to describe your audience, using the example details from the Jane Goodall Institute as a reference.

What do you want to know about your audience?	Why does this matter for your initiative?	What about your audience?
What do they value and care about? Example: Football, family, church	Messages that appeal to what people already care about and value are most powerful.	
How do they spend their time? Example: Farming activities, village meetings, at the market once per day	Reaching people where they are helps reduce barriers to their participation in change.	
What barriers may prevent them from engaging in the behavior you want them to do? Example: Not enough time, lack of materials to create compost, lack of training/awareness about compost, no farming tools to turn compost pile over, fear of chimpanzees	Barriers will prevent your audience from engaging in behavior change. The more you know about why they may not change their behavior, the more you can do to support them by removing barriers when possible.	
What might motivate your audience to change their behavior? What benefits can you promote that matter to them? Example: Forests are important for community livelihoods, composting increases bountiful yields for their family	Framing messages and strategies about what your audience cares about and what motivates them – rather than what you or your organization care about – are more likely to resonate with your audience and appeal to their intrinsic motivation to change their behavior.	
Where does your audience get trusted information? Example: Local agriculture extension agent, village meetings, Joy FM Radio	Collaborating with trusted sources of information to spread your campaign messages is a powerful approach to behavior change communication.	
What do they know or think about the species or habitat you want to conserve? Example: Farmers know the forests are important for many reasons, they do not know about 'soil fertility', they know chimps raid crops and pose a threat to children	The more you can be aware of your audiences' feelings and knowledge about the issues you are trying to address, the better you can address their concerns or increase awareness and knowledge about key aspects of your initiative.	



PART FIVE

SELECTING YOUR CONSERVATION BEHAVIOR FRAMEWORK

CONTENTS

Framework to inspire behavior change

Theory-based pathways to action

Pathway 1: Knowledge and cognitive processing

Pathway 2: Attitude toward the behavior

Pathway 3: Values

Pathway 4: Personal norms / Sense of responsibility / Identity (personal, environmental)

Pathway 5: Subjective / Social norms

Pathway 6: Perceived behavioral control / Ability to impact issue, self-efficacy, direct experience

Pathway 7: Behavioral intention

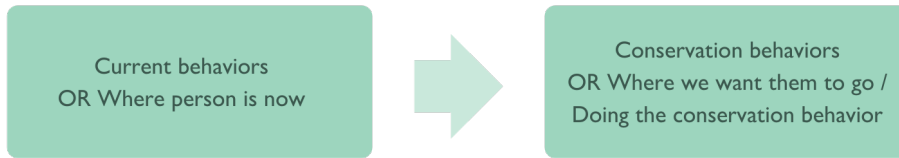
Pathway 8: Sense of place / Significant life experience

Pathway 9: Emotional affinity / Empathy

Pathway 10: Connector cues triggering action

Framework to Inspire Behavior Change

What motivates people to take action?



Now, how do we encourage people to adopt pro-conservation behaviors? Let's take a closer look at your diverse audience. We want your conservation efforts to be as effective as possible. In the next section, we will explore the range of perspectives audiences may hold. These different viewpoints shape motivations and barriers to action, meaning there are many possible paths a person can take toward a desired conservation behavior.

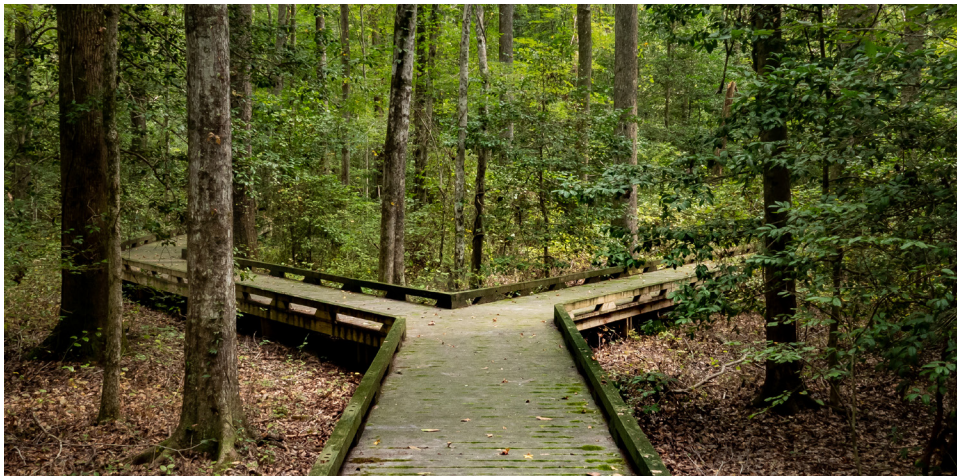
How humans make choices:

Humans are complex and not always rational. Behavior change strategies must go beyond simply raising awareness or increasing knowledge. Effective conservation campaigns consider the full range of factors that influence how people think, what motivates them, what barriers they face, and why they choose to act. For example, persuasive messages can be tailored to specific thought processes and motivations that are most relevant to an audience, helping guide them toward a desired behavior (Pelletier and Sharp 2008).

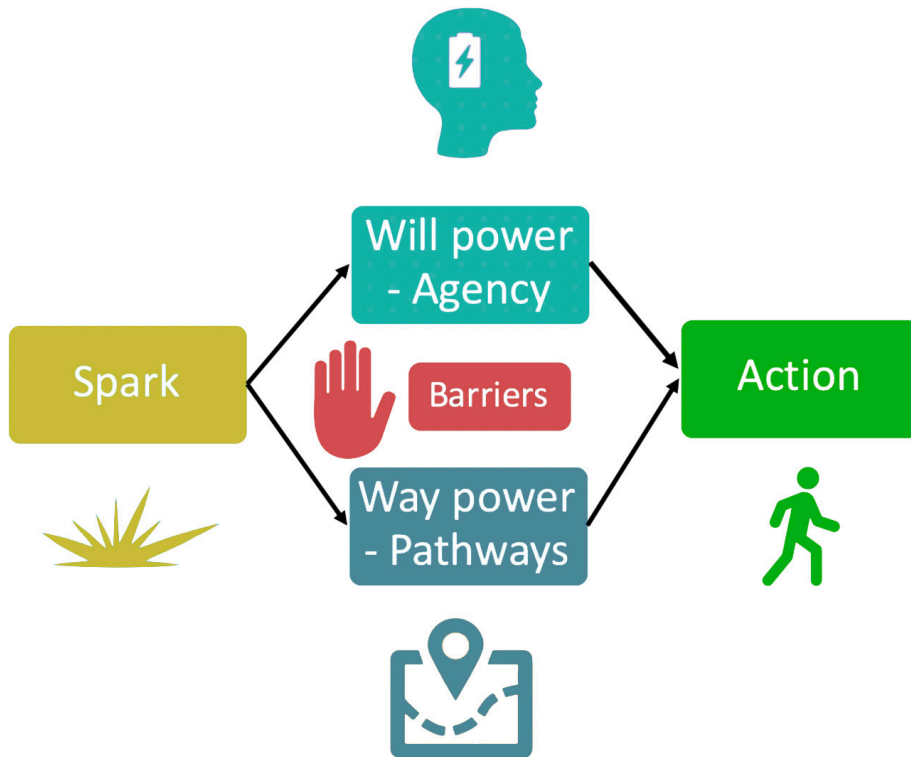
Conservation marketing:

Conservation marketing helps target audiences process information and feel connected to an issue, while reducing barriers and making it easier to take action (Wright et al. 2015). These messages are built around factors that resonate with audiences, such as their values and interests.

There are many reasons why someone may choose to take action, and just as many reasons why they may choose not to. The following 10 factors will help you better understand what influences a person's intention to act.



Framework to Inspire Behavior Change



Based on Hope Theory (Snyder, 1994)

With spark, will power, way power, and getting over barriers, people can successfully get to taking action!

Components of each of the upcoming behavior change pathways:



Way power: The know-how that increases someone's ability to take an action. *Their how.*



Spark: A prompt, reminder, or catalyst to consider taking an action.



Will power: The motivation that increases someone's interest to take an action. *Their why.*



Barriers: Mental or physical obstacles that might prevent someone from taking an action.

As you read through each of the pathways ahead, think about the different ways you may have seen these components acted out in your own life experiences.

The following sections will guide you through the factors that influence how different people make decisions. Understanding these elements is essential for achieving effective conservation engagement and ongoing behavior change.

Theory-based pathways to action

Each pathway represents a factor to consider when influencing your audience's willpower and way power to overcome barriers and take action. These pathways bring together concepts from several related psychological theories. Each one includes Willpower (with a visual route description) and Waypower (including barriers, techniques for overcoming them, and relevant theories). In the following sections, we will walk you through each pathway to help you understand how different people make decisions.

PATHWAY 1: Knowledge and cognitive processing

PATHWAY 2: Attitude toward the behavior

PATHWAY 3: Values (3 types)

PATHWAY 4: Personal norms, sense of responsibility, and identity

PATHWAY 5: Subjective and social norms

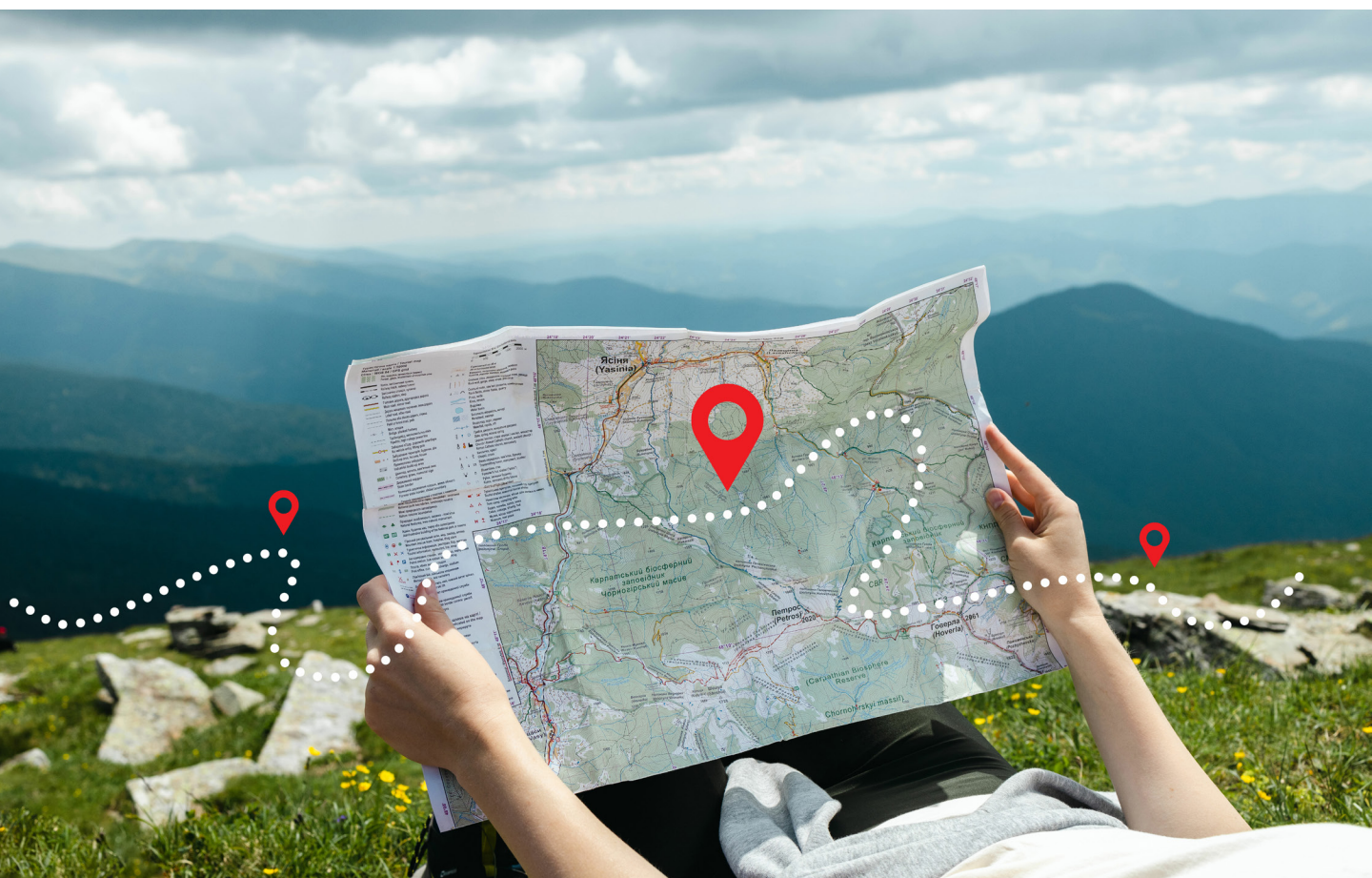
PATHWAY 6: Perceived behavioral control / ability to impact the issue, self-efficacy, and direct experience

PATHWAY 7: Behavioral intention

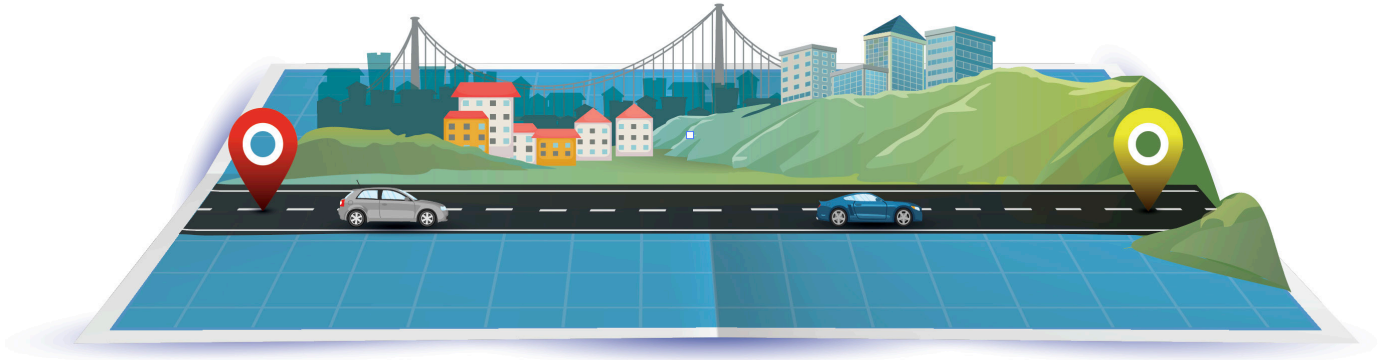
PATHWAY 8: Sense of place and significant life experience

PATHWAY 9: Emotional affinity and empathy

PATHWAY 10: Connector cues triggering action



PATHWAY 1: KNOWLEDGE AND COGNITIVE PROCESSING



Definition:

- Relevant knowledge about the conservation issue and behavior is provided
- Effortful thinking processes the information to support the merits of the conservation behavior
- The presence of helpful information and argument quality impacts their motivation / will power



WILLPOWER

are you motivated to take this path?

Route: People who process information cognitively take shortest and most direct path, walking a straight logical line from information to action



BARRIERS

the obstacles that slow you down

What barriers might stand in the way of this path? Add to the list below:

*I don't know about the problem
I don't know what I can do about it*



WAYPOWER

do you know how to take action?

Techniques to use this factor:

- A person's ability to process information affects their understanding. Support this by minimizing distractions, repeating key messages, building on prior knowledge, and ensuring messages are clear and easy to understand.
- High-quality information, combined with the ability to process it, can foster favorable thoughts toward a behavior. These changes are more enduring, resistant, and predictive of action.

REAL-WORLD USE

Theories

- Knowledge-Deficit Disorder
- Elaboration Likelihood Model (central route)
- Diffusion of Innovation (innovation characteristic #3 – simple over complex)
- Cognitive Dissonance

PATHWAY I EFFECTIVENESS

Recycling behavior can be learned through increased procedural knowledge (Schultz 2002). Training zoo staff on how to promote visitor processing of conservation messages during animal talks significantly increased zoo visitor satisfaction, their perceived connection to the species and their processing of the information that could lead to conservation actions (MacDonald, E., Milfont, T., & Gavin, M. 2016).



PATHWAY I EXAMPLE MESSAGING

Michigan's "Know it before you throw it" campaign details the rules of recycling.

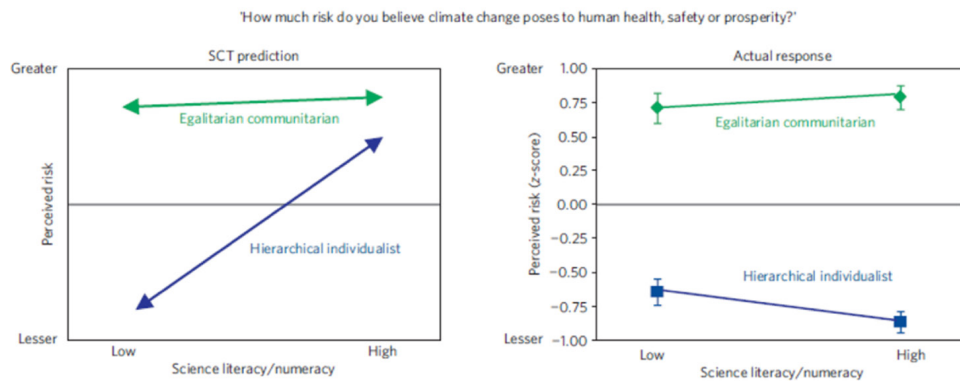
<https://recyclingraccoons.org/>



Exceptions:

But people can also face new information and choose not to process it:

- Cognitive dissonance occurs when new information is processed but conflicts with existing beliefs or behaviors. In these cases, either the beliefs or the behaviors must change (Festinger 1962).
- Knowledge alone is often not enough to motivate action, as it is rarely correlated with any behavioral intent (Clayton et al. 2017).
- For example, Moss et al. (2014) found that zoo visitors increased their knowledge during their visit, but this did not directly lead to changes in behavior.
- A media campaign in Canada increased public awareness of greenhouse gas emissions by 52%, yet resulted in almost no measurable change in behavior (Environment Canada 2006).
- Additionally, Kahan et al. (2012) found that increasing knowledge about climate change does not necessarily increase perceived risk or willingness to act. Instead, how individuals interpret information is shaped by their worldviews and political identities—the lenses through which they understand the world. These findings highlight the need for multiple pathways to engage audiences, especially when cognitive approaches alone are not effective!



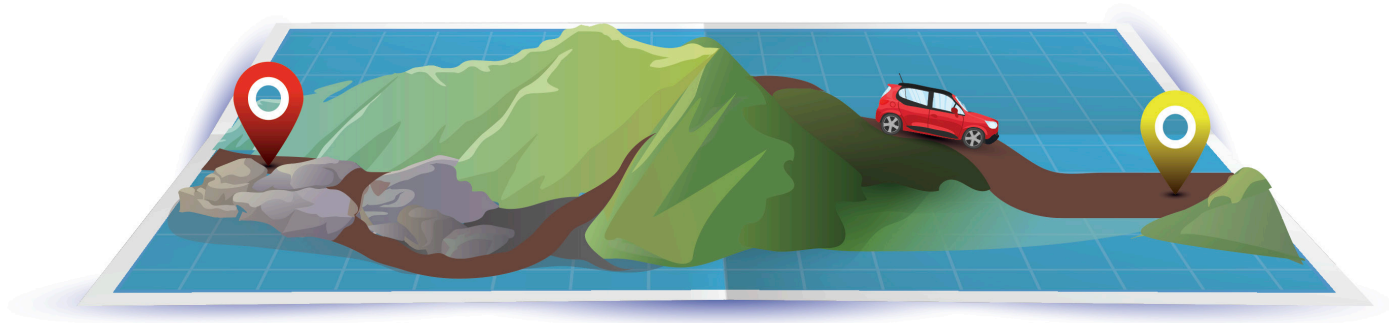
Example predictions and actual findings from Kahan (2012): Science educators determined how they would teach about climate change not based on the information but instead on their cultural values (Kunkle and Monroe 2018).

Does this factor stand out to you as applicable to your target audience for your target behavior?

☐ YES!

☐ NO

PATHWAY 2: ATTITUDE TOWARD THE BEHAVIOR



Definition:

Beliefs about a behavior, including one's disposition toward it and evaluation of its outcomes, shape whether the behavior is viewed positively or negatively (Ajzen 1985).

The relationship between attitude and behavior is a core topic in social psychology. In general, "people who hold positive attitudes are more likely to engage in behaviors that support or enhance the attitude object, while those with negative attitudes are more likely to engage in behaviors that avoid, oppose, or hinder it" (Eagly & Chaiken 1993, p. 155).



WILLPOWER

are you motivated to take this path?

Route: Hilly and meandering while the driver processes the message and links the topic to their concerns and beliefs. Once the connection is made, the attitude is achieved and can ease the downhill slope toward doing the target behavior. Concerns about the topic of the species or ecosystem are relevant and influential here, as well as beliefs or connections to the target behavior.



BARRIERS

the obstacles that slow you down

What barriers might stand in the way of this path? Add to the list below:

"I don't think my actions make a difference"; "I don't like the messenger;" "I don't like snakes;" "I think other people will solve this;" etc.



WAYPOWER
*do you know how
to take action?*

Techniques to use this factor:

- Document the cumulative impact of current behaviors and celebrate progress to build positive attitudes toward the desired behaviors.
- Provide encouragement, praise, and positive role models.
- Highlight the relative advantages and benefits of the desired behaviors compared to current behaviors.
- Reframe or structure choices to guide people toward conservation-friendly options. For example, place sustainable options first, use eye-catching design, and emphasize their benefits.

REAL-WORLD USE

Theories

- Theory of Planned Behavior
- Value-Belief-Norm Theory
- Diffusion of Innovation (innovation characteristic #1 – relative advantage)
- Environmental Concern

PATHWAY 2 EFFECTIVENESS

Participants in a fisheries citizen science program are most motivated by their perceived positive attitudes / benefits, such as “the desire to improve fisheries data, contribute to original research, and benefit scientists as well as to improve fisheries for the enjoyment of all” (Crandall et al. 2018).



PATHWAY 2 EXAMPLE MESSAGING

The Jane Goodall Institute (JGI), the ForeverWild campaign anchors on strong attitudes and concern for wildlife.

<https://news.janegoodall.org/2018/10/08/hope-species-staying-foreverwild/>



Does this factor stand out to you as applicable to your target audience for your target behavior?

☐ YES!

☐ NO

PATHWAY 3: PERSONAL IMPACT, COMMUNITY IMPACT, AND PLANET IMPACT



Definition:

People hold different values and worldviews that shape how they perceive the importance of issues and influence their motivations. These values affect both intrinsic and extrinsic motivations, often framed as “What do I get out of it?” They also influence whether someone is receptive to a message, as people are more likely to listen to messengers who align with their values or in-groups.

- For example, biospheric, altruistic, and egoistic values shape how individuals understand and prioritize issues, and can motivate different people to take different pathways toward the same behavior.



WILLPOWER

are you motivated to take this path?

Route: Different perspectives that can interpret the same issue and get to the same action – Driving down city streets and turning at different blocks/roads - Many different paths could get from A to B. And many different types of people can choose the best path for them based on their values.

What values does your target audience hold?



BARRIERS

the obstacles that slow you down

What barriers might stand in the way of this path? Add to the list below:

“That issue/species is not relevant to me”



WAYPOWER
do you know how
to take action?

Techniques to use this factor:

- Tailor messages, campaigns, products, and marketing to be personally relevant and appealing to your target audience and their value perspectives. This often means speaking to concerns such as security, convenience, profit, status, or enjoyment, rather than sustainability alone.
- For local audiences, frame messages about the importance of a species in ways that connect to individual values (egoistic) or community values (altruistic).
- Activate extrinsic motivations by offering incentives such as rewards, coupons, or discounts that appeal to individual benefits.
- Ensure the results of the behavior are visible to reinforce action. Use side-by-side comparisons to clearly show differences and benefits.

REAL-WORLD USE

Theories

- Value-Belief-Norm Theory
- Environmental Concern

PATHWAY 3 EFFECTIVENESS

- In an experimental study of U.S. voters, messages using the values of protection and responsible management moved attitudes about climate change and environmental policy to increase support for pro-environmental actions (Simon et al. 2014). Protection-focused messages were very effective when linked to messages about the consequences of human health to climate change.
- People more often agree with conservation messages that are framed using their values type. For example, zoo visitors more often have high levels of biospheric concern and on average they agreed more with statements using biospheric concern as the frame. As such, the biospheric frame was suggested for other zoos to use for conservation messages (Yocco et al. 2014).
- People with stronger pro-environmental values prioritizing healthy ecosystems are more likely to support environmental protection and participate in conservation actions than people who prioritize egoistic values and individual concerns (Schultz & Zelezny 2003). As egoistic values are predominant in American culture, guiding audiences to see personal environmental impacts is the challenge.



PATHWAY 3 EXAMPLE MESSAGING

- NNOCCI is a strong example of values-based messaging, which focuses on the audience's values rather than the organization's values (as is often the case with organizations like Conservation International). Values-based messaging centers on creating messages that reflect what matters most to your audience, rather than only reinforcing the views of those who already agree (Schultz & Zelezny).
- For example, Conservation International's *Nature Is Speaking* series highlights the value of nature through the message: "Nature doesn't need people. People need nature."



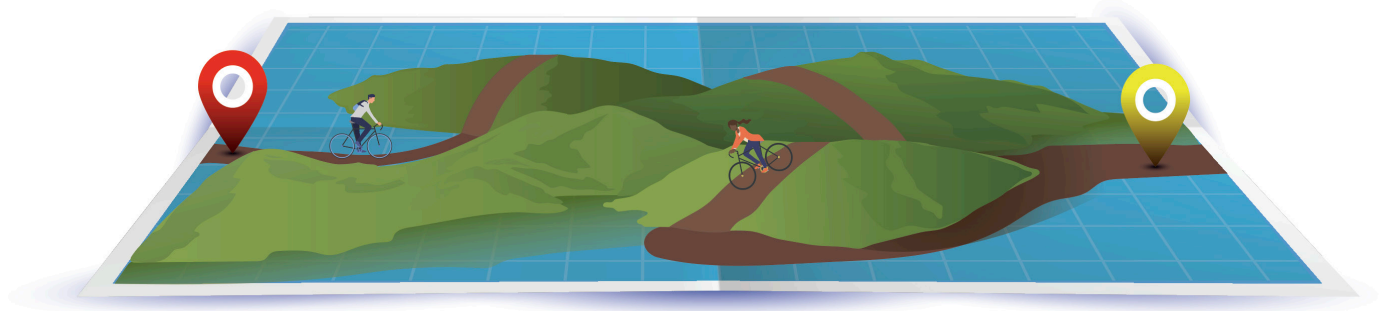
<https://www.conservation.org/nature-is-speaking>

Does this factor stand out to you as applicable to your target audience for your target behavior?

☐ YES!

☐ NO

PATHWAY 4: PERSONAL NORMS, SENSE OF RESPONSIBILITY, AND IDENTITY



Definition:

People can be motivated to act based on their expectations of themselves, especially when they feel a sense of responsibility or identify as someone who takes action on behalf of the environment.



WILLPOWER
are you motivated
to take this path?

Route: Bicycling represents an individual choice that relies on your own abilities rather than others. However, it requires more effort as you provide the power yourself.

How can you align your messaging to highlight how the behavior you want them to take aligns with their personal norms/identify?



BARRIERS
the obstacles that
slow you down

What barriers might stand in the way of this path? Add to the list below:

"it's not for people like me", "It's someone else's problem"



WAYPOWER
*do you know how
to take action?*

Techniques to use this factor:

- Use positive messaging that reinforces social norms, such as “people like you are already doing this.”
- Highlight role models who are similar to your target audience and are already engaging in the behavior.
- Personalize campaigns and communications to reflect individual circumstances, and put a human face on your message. For example, share stories of individuals rather than statistics, highlight locally relevant impacts, and focus on identifiable people and experiences.
- Emphasize how the behavior fits into existing lifestyles, values, and past experiences, and meets the audience’s needs.
- Frame messages about the importance of the species or ecosystem in ways that connect to local identity.
- Avoid attacking opposing views, as this can trigger identity-based resistance and lead to the opposite reaction.

REAL-WORLD USE

Theories

- Norm Activation
- Identity
- Sense of Responsibility
- Diffusion of Innovation (characteristic of innovation #2 – compatibility)

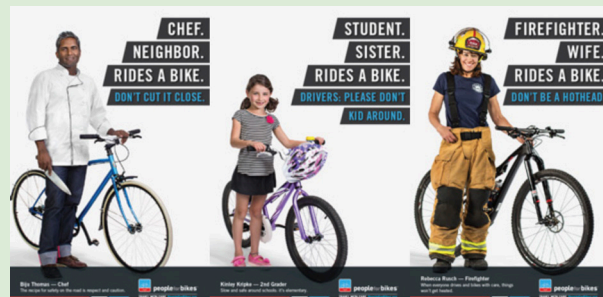
PATHWAY 4 EFFECTIVENESS

- People with a strong sense of personal responsibility for the consequences of their actions were significantly less likely to burn yard waste when they understood it could negatively impact others’ health (Van Liere & Dunlap 1978). Awareness of consequences, or knowledge, can play an important role in developing this sense of responsibility.



PATHWAY 4 EXAMPLE MESSAGING

- U.S. Forest Service’s Smokey the Bear is well remembered for his call to individual action: “Only YOU can prevent forest fires!”
- The “Travel With Care” campaign highlights the individuals who ride bikes, to help people identify with them and feel responsible for bike safety.



<https://bikeportland.org/2014/11/12/national-bike-org-launches-travel-care-safety-campaign-113367>

Does this factor stand out to you as applicable to your target audience for your target behavior?

☐ YES!

☐ NO

PATHWAY 5: SUBJECTIVE AND SOCIAL NORMS



Definition:

Subjective norms influence behavior when individuals perceive a behavior to be common among others or expected by people who are important to them, such as family, friends, peers, or respected figures (Schultz 2002; Rare 2019).



WILLPOWER
*are you motivated
to take this path?*

Route: A bus traveling on a slower road with many stops, but moving together as a larger group. Motivation depends on social dynamics. Are others in their family, friend groups, or community also engaging in the behavior?

What social norms may help facilitate your target audiences' behavior? Or hinder it?



BARRIERS
*the obstacles that
slow you down*

What barriers might stand in the way of this path? Add to the list below:

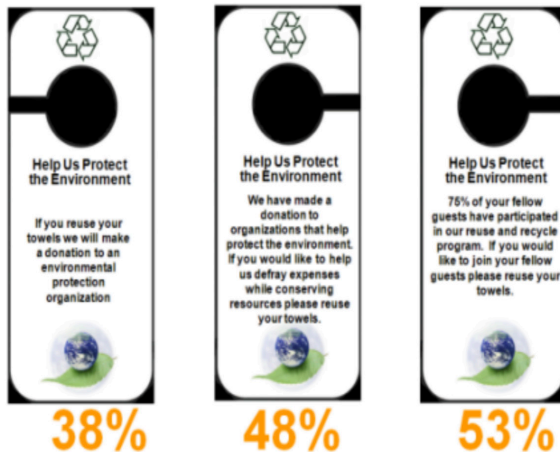
"It's not important to people I know", "People I care about don't care about this issue/species"



WAYPOWER
*do you know how
to take action?*

Techniques to use this factor:

- Frame messages to emphasize that “most people are already doing this behavior;” or, for newer actions, that “more and more people are doing this,” to help establish a positive social norm.
- Encourage commitment through public pledges, signatures, or accountability with friends and family.
- Create opportunities for visible participation and publicly recognize participants with non-monetary awards or acknowledgments.
- Use messaging that reinforces social expectations, such as “someone I admire would want me to do this.”
- Introduce elements of competition or gamification to increase engagement.
- Engage key influencers within social networks to promote the desired behavior.
- Partner with local businesses, government agencies, or trusted organizations to publicly support the action.
- Provide opportunities for families and community groups to participate together.
- Facilitate community discussions through events, meetings, or local forums.
- Establish anonymous reporting systems for conservation violations to build social accountability.
- Use social comparisons, such as showing individuals how their behavior (for example, water use) compares to their neighbors.
- Offer group incentives where rewards are earned only if the entire group adopts the desired behavior; encouraging peer-to-peer accountability where formal enforcement may be limited.



REAL-WORLD USE

Theories

- Theory of Planned Behavior
- Social Identity
- Community-based Social marketing
- Diffusion of Innovation (innovation characteristic #5 – observability)

PATHWAY 5 EFFECTIVENESS

- Social marketing campaigns have effectively reduced bush meat consumption by 62% in the Amazon. The social aspects of public commitments to reducing wild meat were successful, unlike coupons for reducing the price of chicken that did not have an effect on the amount of bush meat consumed (Chaves et al. 2018).
- Subjective norms were the most influential factor for fishers to take action to reduce trauma on fish that were caught and released, and this research suggested

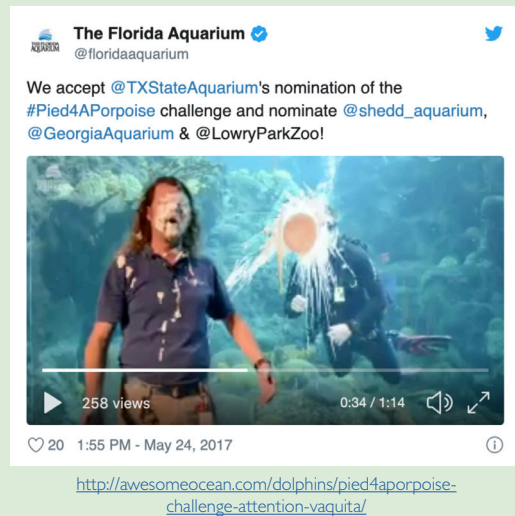


outreach effort can focus on subjective norms to promote the desired fishing behaviors (Crandall, Garlock, & Lorenzen 2018).

- Parents and families can also be impacted by their subjective norms from their children and community. For example, fathers of children in the Amazon who received books about jaguars from their local school significantly reduced their perception of how socially acceptable jaguar killings are. In contrast, the same books distributed by conservation organizations did not have the same impact on their view of jaguar killing – link the behavior to their children and their community school activated the necessary change (Marchini & Macdonald 2019).

PATHWAY 5 EXAMPLE MESSAGING

- #Pied4APorpoise social media challenge



Does this factor stand out to you as applicable to your target audience for your target behavior?

☐ YES!

☐ NO



**Rest Stop: Time for a brain break!**

At this point, we're halfway through learning about the different pathways. Take some time to reflect on the questions below and stretch your brain!

As you were reading through the pathways, which one stuck out to you most?

Do you think you've ever been influenced by a campaign (conservation related or not) that used one of these pathways? Which ones?

When you are in the position of persuading others (either conservation related, or something in your personal life), have you used one of these persuasion tactics? Was it successful?

Was there anything that surprised you about what you've read about so far? Anything that you want to explore more?

PATHWAY 6: PERCEIVED BEHAVIORAL CONTROL, SELF-EFFICACY, AND DIRECT EXPERIENCE



Definition:

Perceived capacity to take action, or self-efficacy, influences whether people engage in a behavior: It reflects how much effort the behavior requires and whether individuals believe their actions can achieve the desired outcome (Bandura 1977; Heimlich and Ardoin 2008).



WILLPOWER
*are you motivated
to take this path?*

Route: Learning to drive a car. Once you develop the skills and obtain a license, you are able to do it. Motivation depends on whether people feel capable of performing the behavior. Have they done it before, and do they believe they have the necessary skills?

What barriers might stand in the way of this path? Add to the list below:



BARRIERS
*the obstacles that
slow you down*

"I don't think I can do it"; "I don't know how to do it"; "It's not possible"

How can you make it seem like the behavior you want them to take is easy for them? How can you actually make it easier for them? What barriers can you remove?



WAYPOWER
*do you know how
to take action?*

Techniques to use this factor:

- Create opportunities for people to try out the desired action.
- Provide training and practice to build the skills needed for conservation behaviors.
- Share tools, resources, and clear, simple instructions to support action.
- Highlight cumulative impact and offer positive feedback to build confidence and optimism.
- Showcase role models or spokespersons successfully performing the behavior.
- Clearly outline pathways that help people achieve their desired outcomes.
- Make the desired behavior easier, more convenient, and quicker to do.
- Increase the difficulty of undesirable behaviors to discourage them.

REAL-WORLD USE

Theories

- Self-efficacy
- Theory of Planned Behavior
- Direct Experience
- Value-Belief-Norm theory
- Diffusion of Innovation (innovation characteristic #4 - Trialability)
- Learned helplessness

PATHWAY 6 EFFECTIVENESS

- Zoo visitors with increased self-efficacy about conservation behaviors after their visit at the zoo were significantly more likely to intend to do the conservation action in the future than zoo visitors without increased self-efficacy (Clayton et al. 2017).
- Conservation workshops with winegrowers in Chile significantly impacted participants' perceived ability to reduce threats to biodiversity on their wineries. Skills-based workshops can build self-efficacy and empower new actions (Marquez-Garcia et al. 2018).
- Direct experience with a topic or action can produce emotions and feelings of connection to the topic, which can then motivate behaviors, over indirect or abstract experiences learning about but not interacting with the topic (Millar and Millar 1996).



PATHWAY 6 EXAMPLE MESSAGING

- Monterey Bay Aquarium's Seafood Watch

Search Seafood Recommendations

Our recommendations help you choose seafood that's fished or farmed in ways that have less impact on the environment.

[Hide Seafood Ratings v](#)

BEST CHOICES Buy first, they're well managed and caught or farmed in ways that cause little harm to habitats or other wildlife.	GOOD ALTERNATIVES Buy, but be aware there are concerns with how they're caught or farmed.	AVOID Don't buy, they're overfished or caught or farmed in ways that harm other marine life or the environment.
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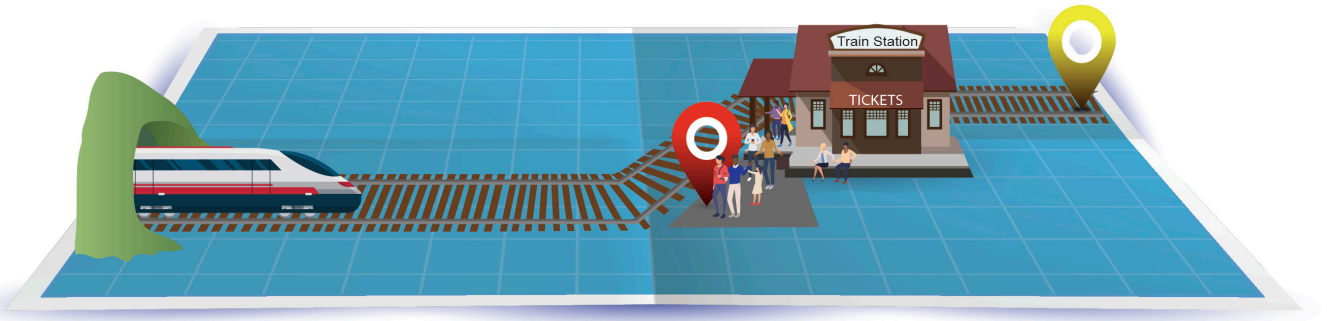
<https://www.seafoodwatch.org/seafood-recommendations/consumer-guides>

Does this factor stand out to you as applicable to your target audience for your target behavior?

☐ YES!

☐ NO

PATHWAY 7: BEHAVIORAL INTENTION



Definition:

Behavior change follows a series of stages as individuals consider a behavior, process the steps involved, and decide whether to take action. This decision, or intention to act, is a key precursor to actual behavior. For example, the Stages of Change theory and the Transtheoretical Model describe six stages of behavior change:

- | | |
|----------------------|----------------|
| 1) pre-contemplation | 4) action |
| 2) contemplation | 5) relapse |
| 3) preparation | 6) maintenance |

However, intention is not a perfect predictor of behavior. Various barriers can still prevent action, including distractions, unexpected events, time delays, interruptions in internal processing, limited access, new information, or reliance on others to act.



WILLPOWER

are you motivated to take this path?

Buying a ticket to travel, showing an intention to go. The mode of transportation can vary, but the key step is making the commitment. Are people motivated to take this action, and are the conditions in place for them to form that intention?



BARRIERS

the obstacles that slow you down

What barriers might stand in the way of this path? Add to the list below:

"I forget about it"; "I'm too busy"; "It's inconvenient and takes too much time and effort"



How can you nudge people, provide reminders, build their confidence, and show examples of others like them successfully taking action?



Techniques to use this factor:

- Create opportunities for public pledges, such as "I will do it!"
- Build accountability by encouraging people to share their commitments with others.
- Connect new actions to audiences' previous behaviors to make participation easier.
- Break actions into small, manageable steps that lead to larger impact.
- Use prompts, such as stickers, calendar reminders, or emails, at strategic times or locations to trigger action.
- Track progress and provide timely feedback to reinforce efforts and maintain motivation.
- Make it easy and enjoyable for people to decide to take action.
- Encourage audiences to specify when, where, and how they will participate.
- Help audiences anticipate and plan for potential barriers.

REAL-WORLD USE

Theories

- Theory of Planned Behavior
- Stages of Change;
- Diffusion of Innovation
- Transtheoretical Model

PATHWAY 7 EFFECTIVENESS

- Different people are in varying stages building up to deciding to act. Positive experiences, social support, and lack of barriers preventing the action were important influences on behavioral intention when studying whether people will bicycle to work (Gatersleben & Appleton 2007).



PATHWAY 7 EXAMPLE MESSAGING

The Nature Conservancy Pledge to Connect With Nature this month by taking one of these simple actions:

- Taking a nature walk
- Volunteering for nature
- Taking your kids on a nature outing
- Making eco-friendly choices at home

Pledge to Connect With Nature

Worldwide Cities Water Lands

6853 Supporters 3147 Remaining

Sign the Pledge:

I Will Connect With Nature

We need nature ... and nature needs us. I pledge to put my love of the natural world into action this month and do one simple thing to bring nature into my life just a little bit more.

* First Name:

* Last Name:

<https://preserve.nature.org/page/80352/action/1>

Does this factor stand out to you as applicable to your target audience for your target behavior?

☐ YES!

☐ NO

PATHWAY 8: SENSE OF PLACE AND SIGNIFICANT LIFE EXPERIENCE



Definition:

Significant life experiences in nature, such as time spent in natural landscapes or observing wildlife, can inspire feelings of awe and a personal connection to the environment. These experiences have been shown to motivate conservation actions in some individuals (Chawla, 1998).



WILLPOWER
*are you motivated
to take this path?*

Route: A slow walk, sightseeing, or boating on a calm river. This pathway reflects connection to place. Do people feel connected to this place or species? Are they motivated to protect the landscapes they identify with?

Which audiences may *already* feel a personal connection to your target species or habitat? How can you engage and collaborate with them to help achieve your goals?



BARRIERS
*the obstacles that
slow you down*

What barriers might stand in the way of this path? Add to the list below:

"I can't relate to this issue/species"



WAYPOWER
*do you know how
to take action?*

Techniques to use this factor:

- Use framing that emphasizes pride in and connection to place.
- Highlight the uniqueness of the species and local ecosystem when communicating conservation actions.
- Collaborate with local organizations and community groups to build support.
- Provide opportunities for recreation and encourage people to experience the place and its wildlife.
- While these individuals may not be your primary target audience, they can offer valuable insights into community priorities and help influence others.

REAL-WORLD USE

Theories

- Sense of Place
- Significant Life Experience

PATHWAY 8 EFFECTIVENESS

- Professional environmentalists, such as environmental educators, have had significant life experiences in natural spaces that influenced their career choice and lifestyle (Chawla 1998).
- A greater connection to place was found to be connected to participation in citizen science programs about coastal seabird surveys (Kaywood, Parrish, & Dolliver 2016). A place-based conservation citizen science program can promote personal connection and then influence individual and community conservation actions.



PATHWAY 8 EXAMPLE MESSAGING

- RARE's Community Pride Campaigns
- A famous local musician and messages!
- <https://www.youtube.com/watch?v=awbGrcUzoKM>



Does this factor stand out to you as applicable to your target audience for your target behavior?

☐ YES!

☐ NO

PATHWAY 9: EMOTIONAL AFFINITY AND EMPATHY



Definition:

Experiences that evoke emotional responses can increase concern for conservation issues and motivate behavior (Routman 2018). Both past and present experiences play an important role in developing emotional affinity toward nature (Kals, Schumacher, & Montada 1999).

When individuals physically or cognitively take the perspective of another person or animal, they can experience empathy, which influences concern for that being's well-being. "By taking the time to feel or understand the emotions, experiences, and needs of an animal, we may recognize unmet needs or opportunities to improve its life. In these moments, we may be more likely to take conservation action because of our empathetic connection to that animal" (Young, Khalil, & Wharton 2018, p. 5).



WILLPOWER
are you motivated
to take this path?

Route: A winding path with ups and downs, or a hot air balloon ride on a windy, shifting day. The journey can be unpredictable—sometimes fast, sometimes slow—but it reflects the variability of emotional experiences we can create.

Are the conditions right to evoke an emotional response for your audience? Can you guide them to take the perspective of the animal involved in this conservation issue?



BARRIERS
the obstacles that
slow you down

What barriers might stand in the way of this path? Add to the list below:

"It's depressing. I don't want to think about it"



BARRIERS CONTINUED

How can you highlight similarities between the species and your audience? What story can you tell about the habitat/place that they can relate to?



WAYPOWER *do you know how to take action?*

Techniques to use this factor:

- Ask what your audience is emotionally invested in and connect your behavior change strategy to those priorities so they can see the benefits.
- Use pronouns such as “he” or “she” when referring to individual animals to encourage empathy, rather than using “it.”
- Create exhibits, programs, and media that build connection, appreciation, and empathy.
- Leverage positive emotions to motivate action.
- Use messaging that evokes emotions such as pride, self-efficacy, joy, and gratitude.
- Avoid relying on negative emotions such as guilt, disgust, and fear.

REAL-WORLD USE

Theories

- Emotional Affinity
- Empathy

PATHWAY 9 EFFECTIVENESS

- Emotional messages: Research shows that both strongly positive and strongly negative emotions can capture attention and engage audiences when viewing conservation content (Jain et al. 2019). However, positively framed messages are more effective at motivating helpful conservation actions, such as donating or volunteering, compared to negatively framed messages (Jacobson et al. 2019).
- Emotional framing in interpretation in zoos can influence the efficacy of messages to promote conservation actions for visitors (Wijeratne, Van Dijk, Kirk-Brown, & Frost, 2014.)
- Empathy tool - <https://informatics.org/wp-content/uploads/2019/10/Best-Practices-Briefing-2019-FINAL.pdf>



David Attenborough - Wonderful World - BBC - YouTube

YouTube · CopterVideo

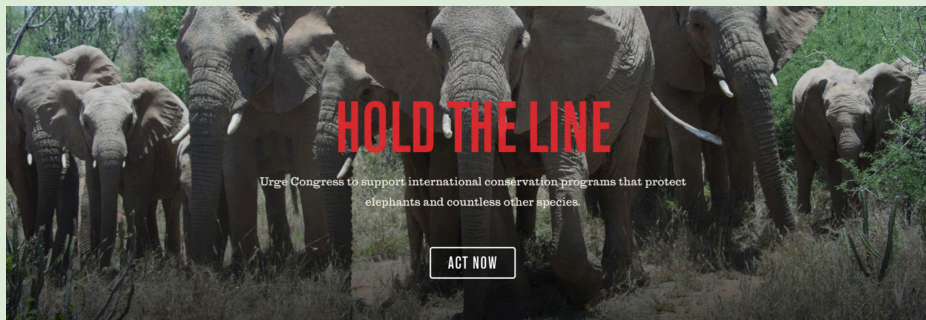


96 Elephants: A Killing at the Bai

- Empathic feelings for others' suffering impacted people's pro-environmental values, behavioral intentions, and reported conservation actions, such as donations to environmental organizations (Pfafftheicher et al. 2015).
- When people are prompted to have empathy for an animal and see from its perspective, they have increased commitment to conservation behaviors to support this animal (Schultz 2000; Berenguer 2007).

PATHWAY 9 EXAMPLE MESSAGING

- Emotional campaigns from WCS 96 elephants



<https://www.wcs.org/96-elephants>

Does this factor stand out to you as applicable to your target audience for your target behavior?

☐ YES!

☐ NO

PATHWAY 10: CONNECTOR CUES TRIGGERING ACTION



Definition:

Some people act without consciously thinking through their decisions. A cue or prompt can trigger action and provide positive reinforcement, encouraging behavior without requiring individuals to fully process why the action is important (Petty & Priester 1994).



WILLPOWER

are you motivated to take this path?

Route: A connector cue (like social media) triggers action—like being carried straight to the behavior without thinking about how you got there.

Is there a cue that can prompt the desired action? Can the behavior occur without extensive cognitive processing when people are externally motivated?

Which influencers does your target audience trust when they don't have the time to fully think through a call to action or behavior change?



BARRIERS

the obstacles that slow you down

What barriers might stand in the way of this path? Add to the list below:

"I've never heard of it."; "Who cares?"



WAYPOWER
do you know how
to take action?

Techniques to use this factor:

- Use the right messenger. This could be a credible authority figure, whose expertise people trust without needing to fully process the information, or a well-known spokesperson or celebrity the audience identifies with or admires.
- Identify which individuals, organizations, or brands are most influential for promoting the message, product, or behavior.
- Incorporate gamification to make the behavior engaging and easy to participate in, rather than feeling effortful.

REAL-WORLD USE

Theories

- Elaboration Likelihood Model (connector route)
- Diffusion of Innovation (Rogers 2003)
- Community-based Social Marketing

PATHWAY 10 EFFECTIVENESS

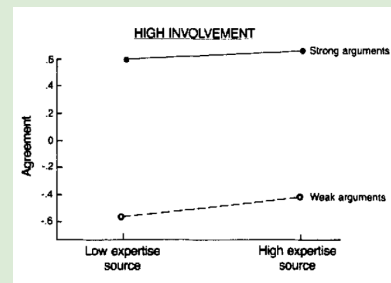
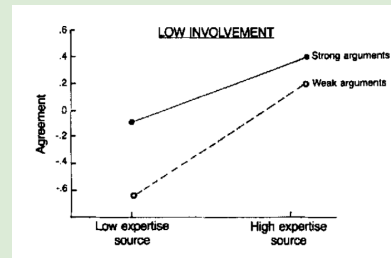
- People with limited understanding of or involvement in a topic are more likely to be influenced by both strong and weak arguments when a highly credible expert is the source. In contrast, individuals with greater knowledge are less influenced by expert sources, as they already have an established understanding. Therefore, to motivate agreement and encourage behavior change among general audiences, it can be effective to use credible experts to support your messages (Petty and Priester 1994).

PATHWAY 10 EXAMPLE MESSAGING

- Celebrity spokespeople inspiring new audiences to act without needing the cognitive processing.



<https://www.rewild.org/team/leonardo-dicaprio>



Does this factor stand out to you as applicable to your target audience for your target behavior?

☐ YES!

☐ NO

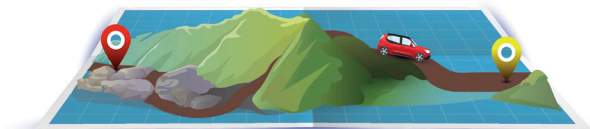
REVIEW: ALL TEN PATHWAYS



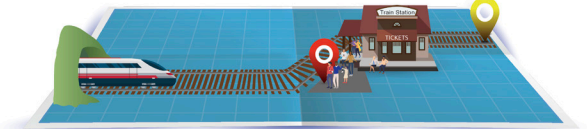
Pathway 1: Knowledge and cognitive processing
A straight road from information to action.



Pathway 6: Perceived behavioral control, direct experience, self-efficacy, and perceived ability to impact issue
Getting your license and gaining the tools and know-how to drive.



Pathway 2: Attitude toward the behavior
A more adventurous road for processing connections to concerns and beliefs that reinforce a downhill slope to action.



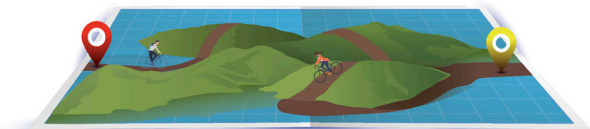
Pathway 7: Behavioral intention
Buying your train ticket and waiting on the platform; gearing yourself up with full intention of getting on the train.



Pathway 3: Values
Valuing different things (biospheric, altruistic, or egoistic values) gives you multiple ways of getting to the same end result to take action.



Pathway 8: Sense of place
Having significant memories and moments that lead to you valuing those places, people, or events and taking action to protect them.



Pathway 4: Personal norms, sense of responsibility, and identity
Having a very strong sense of self rooted in the issue/cause, leading to self-motivation and self-propulsion - you power your own bike through the hills!



Pathway 9: Emotional Affinity and Empathy
Emotional, artistic, or particularly compelling messaging and stories help motivate you to action.



Pathway 5: Subjective / Social norms
Moving together as a group, where behavior is shaped by those around you—like riding a bus where the route is set by the collective.



Pathway 10: Connectors quick to act
People who trust the messenger (an expert, someone like them or a celebrity) are primed to act and don't need to know "why."

PART FIVE: SELECTING YOUR CONSERVATION BEHAVIOR FRAMEWORK

Now that you have reviewed all of the pathways, check all of the ones here that you identified as relevant to your project. Then, rank the checked pathways by their potential to influence your target audience.

Pathway	Is this relevant to your project? Check if yes:	Rank these in order of influence on your project:
Pathway 1: Knowledge and cognitive processing		
Pathway 2: Attitude toward the behavior		
Pathway 3: Values		
Pathway 4: Personal norms, sense of responsibility, and identity		
Pathway 5: Subjective / Social norms		
Pathway 6: Perceived behavioral control, direct experience, self-efficacy, and perceived ability to impact issue		
Pathway 7: Behavioral intention		
Pathway 8: Sense of place and significant life experience		
Pathway 9: Emotional affinity and empathy		
Pathway 10: Connector cues triggering action		



Finally, don't forget the SPARK!

- Stickers near where behavior occurs
- Schedule on calendars
- Notifications in your email or text
- Location-based settings for location-specific behaviors
- Tell your friends and family to promote accountability
- Scheduled check-ins with loved ones or teammates
- Record your progress and set goals for completing projects
- Make it a game
- Post your progress on social media

What other sparks can you think of related to your project? What kinds of sparks help motivate you to take actions?



PART SIX

A THEORY OF CHANGE

CONTENTS

Theory of change model

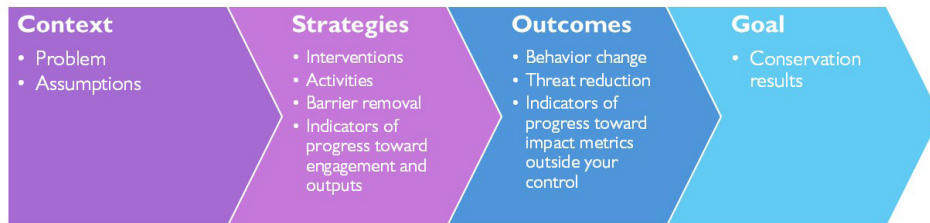
Writing your theory of change

A Theory of Change

Creating a model to guide your audiences

A Theory of Change is a model used to map the steps needed to achieve your desired impact. Simply put, it organizes your project actions and the outcomes that lead to your intended goals.

Organizing your content before writing your Theory of Change



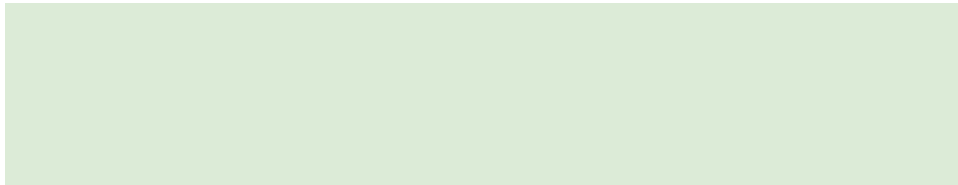
Assumptions provide space to consider what is already known about current knowledge, attitudes, and social interactions related to the problem. With this context, you can then identify how to shift actions and outcomes to reach your conservation goal. These assumptions can be explored within your Theory of Change or in your Logic Model.

A Theory of Change is both a planning process and a tool for evaluating your project.

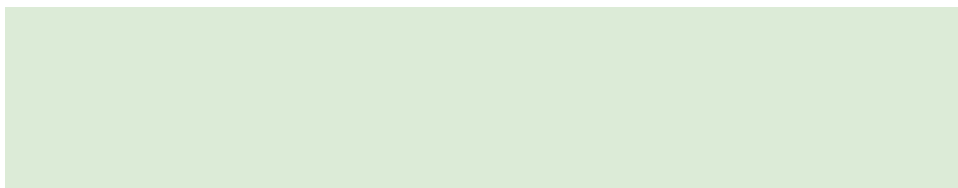
Steps:

1. Start with your goals and outcome, then work backward to identify the steps needed to achieve them.
2. Identify the interventions and activities required to create the right conditions for success.
3. Define indicators of success for each step along the chain.

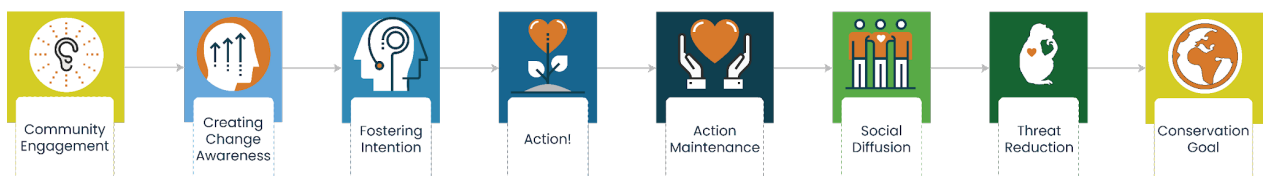
Restate your top 2-3 priority Pathways (reference page 70).



Rewrite your goal statement (reference Part Two).



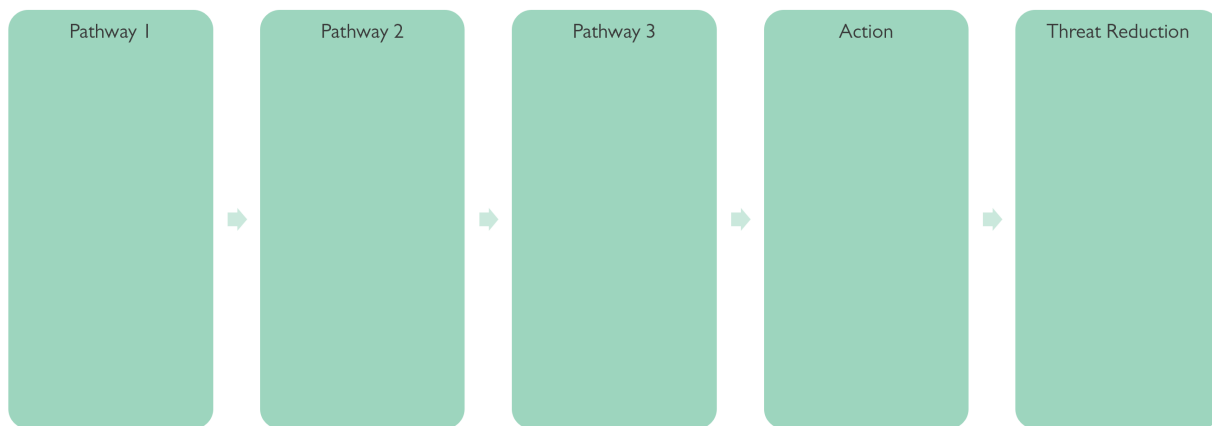
Example theory of change model by Impact by Design



Writing Your Theory of Change



1. Fill in the top two or three pathways you identified on the previous page, highlighting how you will promote willpower and waypower (how you will build awareness and foster intention for change!).



2. Review each step in your Theory of Change. Ask yourself, how could each step be designed to enable the next step?

3. If there is a gap in the logic, add additional steps or details to clarify the process you want your audience to go through.

4. Brainstorm activities to engage your audience, helping them develop new perspectives and move through your Theory of Change.

What are your ideas for unique interventions?

Example Interventions:

- Campaign to increase awareness and promote positive attitudes to the behavior
- Host events for social interaction about behavior
- Convenience for behavior increased with reduced barriers

What are your ideas for unique indicators of progress for your target audience?

Example Indicators:

- Knowledge of the issue and awareness of the impact of the behavior increases
- Positive attitudes to the behavior increase
- Barriers to doing the behavior are reduced

Based on the important factors in your Theory of Change, draft your own conservation behavior message:

How might your conservation campaign reinforce action maintenance (engaging repeated participation) and/or social diffusion (inviting more people to participate)?

Congratulations! You've started outlining your Theory of Change and Conservation Behavior Change Campaign! Now share this with your network and colleagues for help adding to your ideas and designing the implementation.

PART SEVEN

COMMUNICATIONS PLANNING

CONTENTS

Diffusion of innovation

Messaging matrix

Behavior change campaign messaging prompts

Target themes

Communications plan worksheet

Communications planning: How will you spread your message?

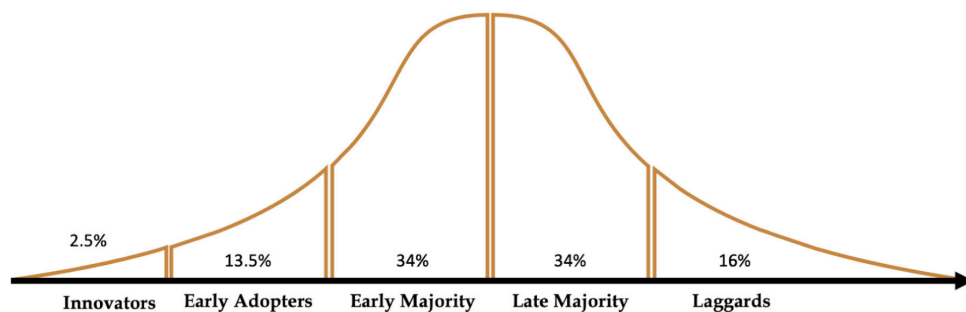
Now that you've selected a behavior, identified your target audiences, and chosen a pathway for change, it's time to plan how you will share your message. In this section, you will develop strategies for when, how, and with whom you will communicate. First, we will explore how messages spread within and across groups of people.

Diffusion of innovation

Our behavior is strongly influenced by the people we interact with, including friends, family, and colleagues. The spread of an innovation—such as a behavior, product, or idea—through a group over time is described by the Diffusion of Innovation theory (Rogers, 2003). As an innovation moves from one individual to many, it becomes more widely accepted and eventually normalized.

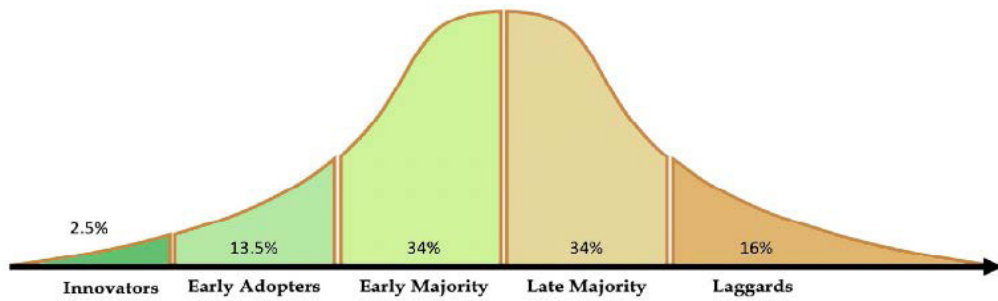
When considering whether to adopt an innovation, people generally fall into five categories:

1. **Innovators:** First to adopt a behavior. Risk takers. Motivated by being a change agent. Sometimes they have more resources (time, money, social capital) than other groups, enabling them to be the first to try something.
2. **Early adopters:** Motivated by being an opinion leader, trend setter, or role model for others. They can tolerate some risk.
3. **Early majority:** Motivated by reliability and proven applications of an innovation. They may be prudent and more likely to avoid risk than innovators and early adopters.
4. **Late majority:** Motivated by peer pressure, necessity, and proven solutions. They may be skeptical, cautious, or cost-sensitive.
5. **Laggards:** Last to adopt a behavior. They may be isolated from opinion leaders, lack access to the innovation, be skeptical of it, or desire to maintain the status quo. Some people never adopt the behavior (non-adopters).



When developing your messages and communication strategies, consider what may motivate people in each adopter category. Is your target audience represented across all categories, or only a few? Tailor your approach to reflect these differences and appeal to what matters most to each group, such as reliability or trendiness.

As you craft your messages, it can be helpful to identify who in your audience might fall into each category and what characteristics or beliefs they may hold. On the next page, take a few minutes to brainstorm the traits of each key group within your target audience.



Who might be Innovators and Early Adopters of your project? What characteristics would each group likely have that would put them in these categories?

What characteristics would the Early Majority have? What might influence them in your project?

What characteristics would the Late Majority have? What might influence them in your project?

Lastly, what characteristics might the Laggards have in respect to your project? What barriers might be in their way that would put them into this category?

Tips for social diffusion

- Share messages that highlight what most people are already doing. When behaviors are presented as common, they feel more normal and expected, encouraging others to follow.
- The messenger matters—a lot. Who delivers a message can be just as important as the message itself. People are more likely to listen to those they like and trust. Consider whether you or your organization are the best messenger, or if partnering with a trusted voice would be more effective. Use influential messengers within each adopter category to help accelerate behavior adoption.
- Make the behavior visible. Seeing others engage in a behavior publicly can create social pressure, normalize the action, and help people envision themselves doing it. Use imagery of relatable individuals, host demonstrations, or provide opportunities for people to try the behavior before committing.
- Encourage public commitments. When people commit to a behavior openly, it reinforces social norms and provides motivation to follow through.



ACTIVITY: Communications planning | Messaging matrix

Use the worksheet below to help you tailor your messages and approaches for your primary target audience and the audiences that influence their behavior.

Message component	Framing to your audience
Goals & Objectives Clearly define what you hope to accomplish with your messages.	
Overarching Theme/Key Message This sentence provides structure for other messages. Consider what your audience values and what motivates them.	
Sub-Messages & Storylines What else does the audience need to know? What messages will complement the overarching theme of your behavior change initiative?	
Messengers, Sources, & Methods Who should share your messages? How will messages be shared? How often will the messages be shared?	

Audiences that influence your target audience's behavior

In the next table, think of two audiences that have influence over your target audience above. It can be their peers, family, friends, colleagues, influencers, people in power, or anyone that helps guide the decisions of your target audience. Follow the prompts to fill in messaging ideas underneath each influential audience.

Prompt	Influential audience #1:	Influential audience #2:
Goal with this audience:		
Messaging variations for this audience:		
Messengers/ Sources this audience trusts:		
Methods to reach this audience:		
What motivates this audience:		
What barriers may exist for this audience:		

Behavior change campaign messaging prompts*Core brand elements:*

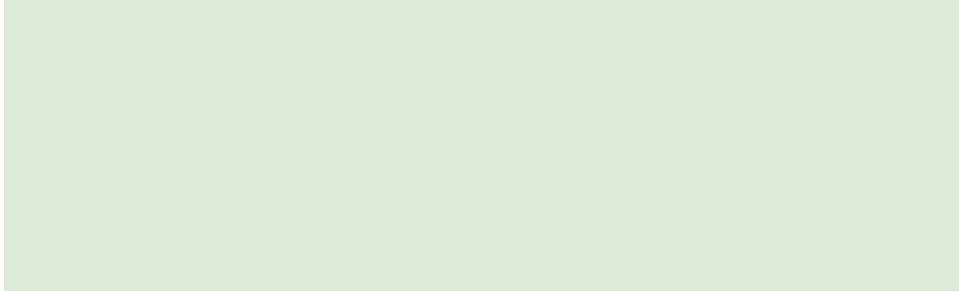
Value Proposition & Positioning (In one sentence, why should this solution matter to your audience?)

Personality & Emotionality (What is the tone you want to take with your communications?)

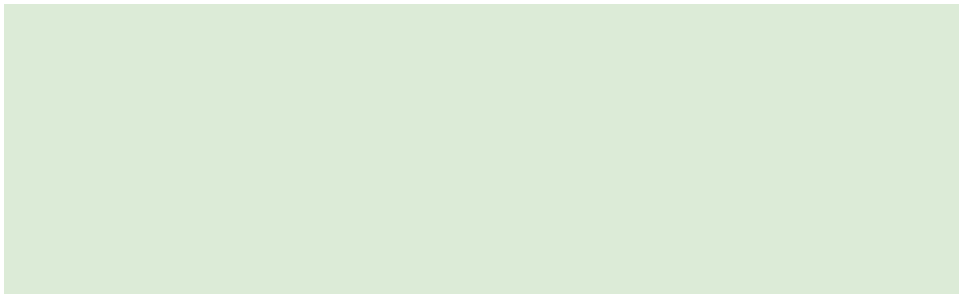
Main Idea (Purpose of the campaign)		Behavior Change Campaign "Tag Line" (Catchy title for branding)
Internal	External	External
The goal of the message		
	How will the message be shared?	

Overarching theme message for the target audience

Write a sentence or two that provides direction and structure for all other messaging. It will be repeated constantly throughout the campaign.



The goal of the message:



Variations of Key Subthemes/Messages for Other Influential Audiences (Provides guidance on tailoring values-based messages for additional audiences that are critical to campaign success.)			
Message Topics (below):	Audience:	Audience:	Audience:
Strategies and Implementation Information for All Other Audiences			
Goals			
Storylines			
Methods / Channels			
Messengers / Influencers			
Barriers			
Motivation			

Subthemes and Storylines for the Target Audience: _____ (Messages that align with the overarching theme and build emotional connections by linking audience values to tangible, relatable topics.)					
Topics:					
Key Subtheme / Message					
Storylines					
Methods / Channels					
Messengers / Influencers					



ACTIVITY: Communications plan worksheet

Use this table to draft your communications plan.

Prompt	Your answer:
What are your goals and objectives for each audience? Clearly define what you hope to accomplish with your audiences.	<i>Example: 1,000 people will sign the pledge, 200 people will share this social media post</i>
Consider who your audience trusts. Who should share your messages?	<i>Example: village official, park ranger, religious leader</i>
Consider where they get information. How will messages be shared?	<i>Example: social media, community event, 88.5FM radio station, one-on-one meetings</i>
Is timing a factor in the behavior? How often and when should messages be shared?	<i>Example: social media posts on 'x' account every 2 days during planting season, community events once per month around voting schedule</i>
How long does the campaign need to last? What is your timeline for beginning and ending your communications strategies?	<i>Example: begin 3 months before mid-term vote, end on voting day</i>



PART EIGHT

COMPLETING YOUR PROJECT PLAN

CONTENTS

Logic model framework

Example 1: Jacksonville Zoo

Example 2: Niassa Lion Project

Example 3: AZA SAFE Corals program

Blank logic model framework

Examples of Complete Logic Models

Example 1: Jacksonville Zoo

Homeschool Zoocademy Program Logic Model

Situation: Many families in Jacksonville, FL homeschool their children. The Zoo's education department has a monthly education program for homeschool students. The zoo is an expanded learning environment for science education and an opportunity for socialization with other children.

Inputs	Outputs		Outcomes (Impact)		
	Activities	Participation	Short term	Medium	Long term
Money • Federal, State, and City funding • Grants • Donations • Registration fees Time Supplies • Art supplies • Worksheets • Picture books • Technology Staff • 3 educators • 1 education manager • Volunteers in each classroom Facilities • Education campus at the Jacksonville Zoo • One classroom for each age group • Auditorium for large groups and animal encounters • Education department, animals for handling in up close encounters • Jacksonville Zoo and Gardens to visit and explore during lessons	Homeschool program with monthly 3 hour classes in 5 cohorts for 3 age groups (ages ranging from 5-6, 7-9, 10-12) • Curricula for 7 sessions for each class by age group • Learning packet for pre- and post-activities for parents Scientific and conservation topics about wildlife are taught through a series of guided inquiry activities and observations at the zoo. Social awareness and skills are taught through group activities, cooperative learning, sharing and listening activities with teachers and fellow students.	• 305 homeschool students (17 students ages 5-6, 20 students ages 7-9, and 24 students ages 10-12 per class) • Homeschool parents in the greater Jacksonville and southern Georgia area.	• Students increase knowledge about science and wildlife. • Students increase skills in observation, inquisitive questioning, the scientific method, and problem solving. • Students increase skills in communication and working cooperatively. • Students increase empathy, positive attitudes, and sense of responsibility towards wildlife and nature. • Students share knowledge and experiences with their families. • Students enjoy learning new ideas about animals and the environment. • Students increase their ability to work in a structured environment.	• Families increase/renew participation in zoo education programs and bring their friends. • Families increase visitation to the zoo. • Students and families apply their new knowledge, attitudes, and skills towards respecting and conserving wildlife and wild places. • Students and families increase their environmentally responsible behaviors in their day-to-day lives. • Students apply new skills to other subjects. • Students develop interests in science for their studies. • Student adapt to a social, structured environment to function well within the program	• Increased revenue for the homeschool education program. • Increased lifelong support for the zoo with donations. • Increased lifelong support for the zoo with participants returning by enrolling their families in more Zoo education programs. • Increased environmental stewardship among students, parents, and the community as a whole. • Students are more educated and prepared to be active, capable citizens with a conservation consciousness. • Increased support for conservation projects for wildlife and ecosystems near Jacksonville and worldwide.

Assumptions

- Participants will be present monthly and throughout 7 month program.
- Parents are willing to and will continue to pay the registration fees for the homeschool program.
- Homeschooling will continue.
- Students are interested in the program's topics.
- The program's topics are age appropriate.
- Participation will increase knowledge of importance of protecting wildlife and wild places.
- Participation will connect kids and families to the zoo.
- Exposure to environmental education impacts families' perceptions of the zoo as a valuable and educational resource.

External Factors

- Parents may have very different goals and objectives for why their child participates in the program.
- Many parents do not want their children to learn about evolution or other topics contrasting to their belief systems.
- Many parents do not want a traditional learning environment.
- Weather interrupts program.
- Conflicts preventing full participation throughout the program.
- There are no unifying learning standards for homeschooled children.



Example 2: Niassa Lion Project

Logic Model for Mariri Environmental Centre Education Program, Niassa National Reserve, Mozambique

Situation: Niassa National Reserve is the largest protected area in Mozambique and is one of the last expanses of wilderness that supports large African lion, wild dog, and elephant populations. This Reserve is home to over 35,000 people in more than 40 villages. While there are over 45 schools in the Reserve, there is no locally relevant environmental education programs for the children and adults living there. The residents view wildlife as a resource, a threat, or a nuisance; they have no opportunities to see and learn about their nearby wildlife, how to coexist with them, conservation in general, nor the protected area in which they live. Low access to education and employment results in predominantly subsistence lifestyles that depend on extraction and use of resources and wildlife. Additionally, with few alternative livelihood opportunities, activities such as logging, poaching for ivory and bushmeat, gold mining using mercury, and poisoning have increased significantly in recent years.

Inputs	Outputs		Outcomes (Impact)		
	Activities	Participation	Short term	Medium	Long term
• Facility at the Mariri Environmental Centre - library / museum, refectory, stage, student cottages, teachers' bedrooms, kitchen, etc. • Staff – educators, project managers • Time • Supplies – activity materials, worksheets, art supplies, food, and fuel • Educational materials – comic book, posters, storybook, ABC capulanas, bird and mammal list • Money – donations and grants	1. Wilderness field trips for 3 days at Mariri Environmental Centre Activities during visit: • Bush visits to see wildlife and Reserve with new opportunities (e.g. wildlife viewing, fishing, hiking) • Conservation education interactive and fun activities in the Reserve • Practical training in sustainable livelihoods, safe behaviors, and reducing human-wildlife conflicts • Participation in a conservation project • Observing and discussing consequences of fires and poaching. • Interaction with conservation staff to provide mentors	1. Wilderness field trips • Students at local schools, 9 years-old and up (15 children and 4 adults per group) • Teachers at local schools To date: 55 students, 8 teachers have participated • Local adults, teachers, village elders, and government officials (19 people per group) 2. Wildlife Clubs at Local Schools • School teacher and student participants in the field trips • Other students in the same classes • Other teachers at the same school	• Participants will increase knowledge about conservation and wildlife in the Reserve. • Participants will increase in knowledge and skills for sustainable livelihoods, reducing human-wildlife conflict, and safe behaviors. • Participants will experience wildlife and explore the Reserve in new ways (participants will have an “ecotourism” experience for the first time and have fun.	• Participants set up wildlife club with sponsorship and teacher support, for weekly activities and yearly celebration participation. • Participants share knowledge and experiences with their families, friends, other students and teachers at their school, and their community. • Participants encourage increased conservation of wildlife, and discourage poaching. • Participants, families, and students apply their new knowledge, attitudes, and skills towards their daily behaviors.	• Wildlife clubs have increasing number of students participating. • Wildlife clubs continue educational activities and participation in yearly competitions. • Increased environmental stewardship among students, parents, and the community as a whole. • Students become strong local advocates for conservation • Students are more educated and prepared to be active residents with a conservation consciousness.

Inputs	Outputs		Outcomes (Impact)		
	Activities	Participation	Short term	Medium	Long term
	2. Wildlife Clubs at Local Schools • Post-visit set up a wildlife club for each school • Select animal theme • Weekly activities to continue learning about and promoting conservation and sustainability • Participate in yearly club competition with performances at Mariri		• Participants increase empathy, positive attitudes, and sense of responsibility toward wildlife, the environment, and the Reserve. • Participants enjoy learning new ideas about animals and the environment. • Participants increase knowledge of rules of reserve and consequence of illegal activities (e.g. fines and jail time).	• Participants increase sustainable resource use. • Participants change livestock, agriculture, and personal behaviors to reduce human-wildlife conflicts.	• Increased support for conservation projects for wildlife and ecosystems in the Reserve. • Decreased unsustainable resource extraction. • Decreased poaching by Reserve residents. • Decreased human-wildlife conflict events.

Assumptions

- Participants will be present for the 3 days of the program.
- Students are interested in the program's topics, and are residents of the Reserve for their whole lives.
- The program's topics are age appropriate and relevant to their experiences / behaviors in the Reserve.
- Participation will increase knowledge of importance of protecting wildlife and wild places.
- Participants will share their knowledge and experiences with their families, friends, and community.
- Exposure to environmental education impacts residents' perceptions of the Reserve as a valuable resource worth protecting with new sustainability efforts.

External Factors

- Weather interrupts program.
- Unexpected conflicts occur, which prevent full participation throughout the program.
- School events (such as exams, holiday breaks, or teacher strikes) prevent participation.

Example 3: AZA SAFE Corals Program

AZA SAFE Corals Community Engagement Plan Logic Model

Inputs	Outputs		Outcomes (Impact)		
	Activities	Participation	Short term	Medium	Long term
SAFE resources from AZA: • Call for Participation for SAFE species • SAFE Conservation Action Plans • Money from SAFE Founders Circle • Corporate partnerships • SAFE program branding • Engagement resources (e.g. Unite for Literacy books, materials for endangered species days, etc.).	SAFE Corals community outreach SAFE Corals education programs at AZA institutions and with SAFE partners SAFE Corals communications and social media SAFE Corals Partners Program agreed upon between organizations Promotion of SAFE Corals from AZA and AZA institutions SAFE Corals meetings with AZA committees	Participation of AZA, AZA partner zoos and aquariums, and SAFE partner organizations # of guests, visitors, and students involved in the program	Organizationally: SAFE Corals engages partner organizations in the Caribbean and the AZA to launch joint coral conservation behavior campaigns	Organizationally: SAFE Corals Partners Program provides structure for transferring knowledge, skills, funds and personnel among partner organizations for campaigns	Organizationally: AZA SAFE Corals collaborative program is implemented that fills past gaps in coral conservation programs
			SAFE Corals Community Engagement program develops in communities: • Increased awareness of coral reefs; • Increased knowledge about coral conservation issues and action opportunities to help; • Increased positive attitudes towards coral conservation behaviors	SAFE Corals Community Engagement program develops in communities: • Increased identity and values with corals and marine animals • Increased behavioral intention and commitment to act on behalf of coral conservation • Increased capacity and self-efficacy to complete coral conservation behaviors	SAFE Corals Community Engagement program develops in communities: • Increased conservation behaviors completed by local community members (e.g. coral courtesy behaviors) • Increased volunteerism (e.g. citizen science) • Increased conscious consumerism (e.g. not eating parrotfish) • Increased advocacy and philanthropy for coral ecosystems (e.g. support for local orgs)

SAFE Corals Opportunities for Audiences to Participate in Conservation Behaviors	Indicators and Long-term measurable outcomes in audiences
Individual Perceptions and Awareness	• Increased participation in education programs / public engagement and outreach programs focused on SAFE Corals • Increased knowledge, attitudes, values, and behavioral intentions for conservation of the SAFE species
Direct Action for SAFE Corals	• Participation in species observations or citizen science programs
Advocacy <i>Spreading a message through social media, signing a petition, or championing legislative change in support of a SAFE species</i>	• Increased knowledge of the message • Increased spreading information about SAFE Corals • Increased environmental stewardship and sense of responsibility • Increased support for conservation policies / laws (e.g. petition signing, letters to politicians)
Philanthropy <i>Making a monetary donation to support in situ conservation efforts for a SAFE species</i>	Increased donations from audience members for the conservation projects: • Specific donations for project needs and • Donations to AZA SAFE Corals organizations
Volunteerism <i>Donating time or expertise to an AZA institution or partner organization involved with saving a SAFE species</i>	• Increased # of zoo volunteers • Increased hours of volunteering • Increased focused on conservation and promoting SAFE projects
Cause Marketing <i>Making purchases that support SAFE through national partnerships</i>	• Not consuming unsustainable fish important to corals (e.g. parrotfish) • Supporting partners through purchases, communications, and social networks - other organizations/corporations partnered with the zoo/aquarium for the specific SAFE project • Increased environmentally responsible behaviors – sustainability of natural resources (3 Rs) • Increased cause marketing and sustainable purchases
Collective / Social Action <i>To build a social movement for endangered species conservation</i>	• Increased commitment to participate in the SAFE Corals project • Increased recruitment of others in personal social network to join in • Increased participation of groups: families, organizations • Increased partnerships with other local conservation organizations

Logic Model Framework

Inputs	Outputs		Outcomes (Impact)		
	Activities	Participation	Short term	Medium	Long term



PART NINE

PROGRAM EVALUATION

CONTENTS

Why evaluation?

Designing your evaluation

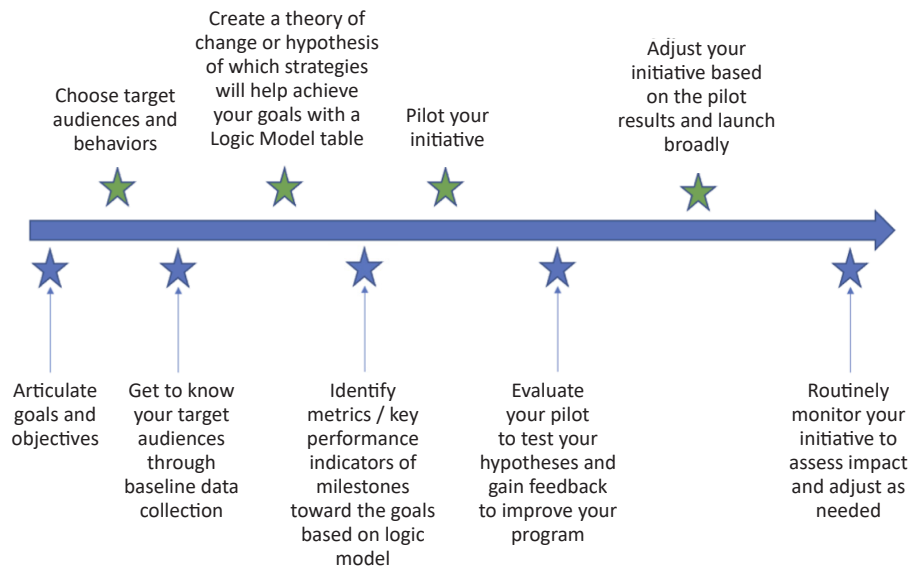
Applying what you learned

Program Evaluation

Why evaluation?

Evaluating your behavior change initiative is an essential step in the overall process. You identified your goals in an earlier chapter; and evaluation is the only way to determine whether those goals have been achieved. This includes assessing progress before, during, and after your project. Ongoing evaluation can help you identify challenges early, highlight successes for donors and stakeholders, and support more objective decision-making when allocating resources and selecting strategies.

The image below illustrates the basic process of designing a behavior change initiative, with the elements related to evaluation highlighted in blue.



What do you want your evaluation to accomplish?

Evaluation helps you understand how impactful your program is and whether you are reaching your goals. It can also provide insight into many other aspects of your initiative. Review the list below and check off the areas that are most important for your program.

- Guide program planning
- Understand stakeholder goals
- Identify participant needs
- Identify areas of improvement
- Assess program components
- Measure progress toward short-term goals
- Examine overall program success
- Determine program impact
- Measure whether objectives were achieved
- Collect results for accountability to administrators and funders

Designing your evaluation

Step 1: Think early about what you want to learn

At the beginning of your planning process, after identifying your goals, draft a list of “learning questions.” A learning question is something you want to explore or evaluate throughout your initiative. These questions can be answered through data, anecdotes, team reflections, or other forms of insight.

Create a shared table or document that your team can contribute to and update as the initiative progresses. Consider what you hope to learn from the campaign, including factors that support successful collaboration, strategies that work well or fall short, and other key insights.

Learning questions	How will we learn the answer?
Does composting address some or a few of the reasons that farmers go to the riverine forest to farm?	<i>Post-pilot data collection, Routine monitoring and evaluation analysis after year 1</i>
What were community leaders’ attitudes toward the campaign before, during, and after?	<i>Baseline data collection, post-pilot data collection, monitoring and evaluation activities at community events with rapid assessment tool</i>
What have we learned that will inform how we will create/secure compost for the future campaign?	<i>Post-pilot team debrief meeting at Pause and Reflect</i>

Step 2: Identify the purpose and expectations for evaluation

Now that you have a system in place to track your learning questions, it’s time to build the framework for your evaluation plan. Begin by clarifying why you are evaluating the program and how the results will be used.

Does your funder have specific monitoring and evaluation expectations you need to address? Do stakeholders want to know certain types of results or details? The list of questions below can help you determine what your evaluation needs to address, so you can collect the right data from the start.

Stakeholders:

- Who will use the evaluation results?
- How will they use these results?
- Does your organization or funder have specific requirements for how evaluation is supposed to be conducted? Do you have access to these expectations and understand them?
- Who in your organization needs to be involved in the evaluation development and implementation? Who outside your organization could support this effort (partners, board members, audience members, or others)?
- Who in your organization needs to be involved in using your evaluation’s findings to adapt your programs?
- Can you reach consensus among key stakeholders on the purpose of the evaluation?



Step 3: Stating the purpose of your evaluation

Now that you have considered what you want to evaluate and what is required, the next step is to clearly define the purpose of your evaluation. For example, your evaluation may aim to assess program effectiveness in order to support future funding requests and expansion. Alternatively, it may be intended for internal use to inform the development of future initiatives. Clearly state the purpose of your evaluation below so you can prioritize the information you need to monitor and assess in order to meet that purpose.

The purpose of evaluation for this initiative is:

Step 4: Planning for evaluation

Use the worksheets on the following pages as a foundation for developing your evaluation plan and to help you know what resources are needed to complete key stages of evaluation.

Team Members Contributing to Evaluation Process	Baseline: Post-Pilot: Ongoing Monitoring and Evaluation:
Information Reporting Timeline <i>When will data be collected and results shared?</i>	Baseline: Post-Pilot: Ongoing Monitoring and Evaluation:
Information Reporting Process <i>How will data be collected and results shared?</i>	Baseline: Post-Pilot: Ongoing Monitoring and Evaluation:
What resources are available for the evaluation process?	Baseline: Post-Pilot: Ongoing Monitoring and Evaluation:
What resources are still needed for the evaluation process?	Baseline: Post-Pilot: Ongoing Monitoring and Evaluation:
What steps do you need to take to accomplish your evaluation plan?	
What challenges do you anticipate?	

Step 5: Identifying key performance indicators and data collection tools

Now it's time to clearly define what you will measure and how you will measure it for your baseline data collection, post-pilot assessment, and ongoing monitoring and evaluation. Refer to your logic model, learning questions, and evaluation requirements from previous sections to determine what information you need to collect. Then outline how the data will be collected, who will be responsible, and when it will be gathered.

Example from Jane Goodall Institute Composting Behavior Change Campaign:

Evaluation Question	Indicators	How will data be collected? (based on identified outcomes)	Who will collect/ analyze data?	When will data be collected?
Does composting address some or a few of the reasons that farmers go to the riverine forest to farm?	After 2 years we see a decrease in deforested patches of key habitat as compared to previous 5 years.	Satellite imagery provided by partner.	Partner supplies shapefiles, GIS department does analysis.	Years 2, 3, and 5
	60% of farmers that participated in the campaign report the behavior addressed at least one reason they were planning to go into the forest to farm.	Rapid audience assessment tool used at all events.	Event trainers and volunteers collect data, BCC specialist analyzes.	At each event
What were community leaders' attitudes toward the campaign before, during, and after?	Community leaders express positive sentiment about the composting behavior and campaign and survey responses increase by 25% over baseline	Focus groups in each village before and after pilot, rapid Likert survey tool used before focus groups	BCC team leader will conduct focus groups, distribute survey, and analyze results	Before the pilot during permission-seeking visits to villages, after the pilot, and one year after launch
What have we learned that will inform how we will create/secure compost for the future campaign?	The team and stakeholders can articulate at least one aspect of the process that went well and one that can be improved.	Survey at Pause and Reflect annual meeting	BCC team leader will send it out and analyze results	At Pause and Reflect meeting each year

After the Evaluation

Applying what you learned

Now that evaluation is underway, you should routinely review your data collection methods and results to determine how your strategies may need to be adjusted. This tool can help you create an action plan based on what you are learning throughout the evaluation process. Refer to this tool periodically throughout the evaluation process (after baseline data collection, during strategy refinement, after the pilot phase, and at benchmarks throughout the campaign) and use it to guide adaptive management of your initiative.

When is this reflection taking place?

The biggest success so far has been:

The biggest challenge so far has been:

The specific actions I will take in the future with this initiative will be (include what, how, and by when):

The things I will tell people (my partners, colleagues, and supervisors) about what I learned will be:

Things we need to explore further:

APPENDICES

ADDITIONAL TOOLS FOR EVALUATION

CONTENTS

Appendix A: Conservation behavior options

Appendix B: Example survey scales for the 10 pathways

Appendix C: Pathway examples

Appendix D: Answers to workbook exercises

Appendix E: Example evaluation of the pathways to motivate conservation action

Appendix F: Example pathways survey scale

Appendix A: Conservation Behavior Options

Specific Self-Reported Conservation Behavior Scales

Measuring conservation behaviors can be complicated. For example, a temporal delay between a conservation message and the audience having the chance to participate (or not) in the desired behavior could hamper your documentation of their actions. Or perhaps the behaviors are in private and not easily observed. Social, psychological, political, and environmental factors might also hinder the documentation.

In these situations, you may need to ask participants directly to self-report their behaviors in a survey or interview. For example, here's a conservation action scale from an evaluation of organization staff involvement in conservation using a variety of categories from the scale below (Maynard et al. unpublished study):

Conservation Action	Not at all	Maybe someday I will do this	I plan to do this	I already do this some of the time	I already do this as often as I can
Reduce my plastic use	1	2	3	4	5
Recycling resources (plastic, paper, etc.)	1	2	3	4	5
Picking up trash when I see it on the ground	1	2	3	4	5
Spread the word on conservation to others in my life (in person or online)	1	2	3	4	5
Create habitat in my backyard or community	1	2	3	4	5
Seek new information about conservation issues	1	2	3	4	5
Select items to purchase that support saving wildlife and are friendly to the environment	1	2	3	4	5
Choose my pets wisely and care for them to reduce wildlife impacts	1	2	3	4	5
Donate my time or money to conservation organizations	1	2	3	4	5
Reduce my pesticide and fertilizer use	1	2	3	4	5
Participate in citizen science	1	2	3	4	5
Behave responsibly around wildlife	1	2	3	4	5
Choosing sustainable food options	1	2	3	4	5
Other action:	1	2	3	4	5

APPENDIX A: CONSERVATION BEHAVIOR OPTIONS

As we discussed in Section 3, conservation behaviors can vary widely. 12 classifications from conservation planning can help to organize the actions:



Based on Maynard et al. (2020), these categories of behavior types build on the conservation planning framework developed by Salafsky et al. (2008) and incorporate additional categories from Stern (2000), resulting in 12 behavior types across 5 categories. Each classification includes specific conservation actions. We have compiled a range of examples for reference; however, this list is not exhaustive and should not limit additional ideas.

On the next page, you will find example behaviors measured through self-reported survey questions, along with the scales used to assess them. References are included where available.



Conservation Behavior Classifications	Example Behavior Items	Scale for measuring responses	Sources
1.0 Environmental activism conservation behaviors			
1.1 Spreading information	Spread the word on conservation to others in my life (in person or online)	1-5 Scale: 1) Not at all, 2) Maybe someday I will do this, 3) I plan to do this, 4) I already do this some of the time, 5) I already do this as often as I can	Maynard et al. unpublished study
	Tell a neighbor, friend, or family member about wildlife and habitats	Every chance I had, Often, Sometimes, or Never	
	Will you commit to meet with family or friends to talk about climate action.	Yes, No	Earth Day Network
	1. I spontaneously speak to my colleagues to help them better understand environmental problems.	Never, rarely, sometimes, often, very often	Boiral & Paille (2012)
	2. Even when I am busy I am willing to take time to share information on environmental issues with new colleagues.		
1.2 Recruiting others	Encouraged friends or family to recycle	Never, rarely, sometimes, often, very often	Arnocky, S., Stroink, M., & DeCicco, T. (2007).
	Join or create a neighborhood clean-up	Yes, No	
	Start a nature appreciation club with your friends	Yes, No	
	1. I spontaneously give my time to help my colleagues take the environment into account in everything they do at work.	Never, rarely, sometimes, often, very often	Boiral & Paille (2012)
	2. I encourage my colleagues to adopt more environmentally conscious behavior.		
	3. I encourage my colleagues to express their ideas and opinions on environmental issues.		
	I make suggestions about environmentally friendly practices to managers and/or environmental committees, in an effort to increase my organization's environmental performance.	Never, rarely, sometimes, often, very often	Robertson & Barling (2013)

Conservation Behavior Classifications	Example Behavior Items	Scale for measuring responses	Sources
1.3 Joining a partner organization	Are you a member of any group whose main aim is to preserve or protect the environment?	Yes, No	Stern 2000
	Joined a group that advocates environmental protection?	Yes, No	Ghazali, E. M., Nguyen, B., Mutum, D. S., & Yap, S. F. (2019).
1.4 Political advocacy	Wrote a letter supporting an environmental issue	Never, rarely, sometimes, often, very often	Arnocky, S., Stroink, M., & DeCicco, T. (2007).
	Voted for a candidate because they supported environmental issues	Never, rarely, sometimes, often, very often	Arnocky, S., Stroink, M., & DeCicco, T. (2007).
	Signed a petition in support of protecting the environment?	Yes, No	Stern 2000
	Written a letter or called your member of Congress or another government official to support strong environmental protection?	Yes, No	Stern 2000
	Signed a petition about an environmental issue?	Yes, No	Ghazali, E. M., Nguyen, B., Mutum, D. S., & Yap, S. F. (2019).
	Took part in a protest or demonstration about an environmental issue?	Yes, No	
	In a democracy, every voice matters — and things only change when you make yourself heard. Will you pledge to vote for environmental progress in your next election?	Yes, No	Vote Earth initiative, Earth Day Network
2.0 Non-activist conservation behaviors in the public sphere			
2.1 Using new learning resources	In the last twelve months, have you read any newsletters, magazines or other publications written by environmental groups?	Yes, No	Stern 2000
	Seek new information about conservation issues	1-5 Scale: 1) Not at all, 2) Maybe someday I will do this, 3) I plan to do this, 4) I already do this some of the time, 5) I already do this as often as I can	Maynard et al. unpublished study
	Research your pets before you buy them	Every chance I had, Often, Sometimes, or Never	
	Use a field guide to identify wildlife from a safe distance	Every chance I had, Often, Sometimes, or Never	
	Learn more about animals that live in local habitats and around the world	Every chance I had, Often, Sometimes, or Never	

Conservation Behavior Classifications	Example Behavior Items	Scale for measuring responses	Sources
2.2 Environmental stewardship	In the past several years, have you made any change in your day-to-day behavior because of concerns about the environment?	Every chance I had, Often, Sometimes, or Never	Stets and Biga 2003
	I would be willing to spend a few hours a week of my own time helping to reduce the pollution problem.	strongly agree or disagree (1-5)	Stets and Biga 2003
	I would be willing to pay much higher taxes in order to protect the environment	Strongly agree, Somewhat agree, Somewhat disagree, Strongly disagree	Stern 2000
	I would be willing to accept cuts in my standard of living to protect the environment	Never, rarely, sometimes, often, very often	Stern 2000
	Some people feel the environmental movement does a great deal of good and strongly support it, others feel the environmental movement does more harm than good and strongly oppose it. Where do you stand?	strongly support, somewhat support, somewhat oppose or strongly oppose the environmental movement	Stern 2000
	Behave responsibly around wildlife	1-5 Scale: 1) Not at all, 2) Maybe someday I will do this, 3) I plan to do this, 4) I already do this some of the time, 5) I already do this as often as I can	Maynard et al. unpublished study
	Don't feed wild animals	Every chance I had, Often, Sometimes, or Never	
	Take only pictures, leave only footprints	Every chance I had, Often, Sometimes, or Never	
	Planning to have only up to 2 children		
	I actively participate in environmental events organized in or by my company.	Never, rarely, sometimes, often, very often	Boiral & Paille (2012)
	I undertake environmental actions that contribute positively to the image of my organization.		
	I volunteer for projects, endeavors, or events that address environmental issues in my organization.		
	In my work, I weigh the consequences of my actions before doing something that could affect the environment.		

APPENDIX A: CONSERVATION BEHAVIOR OPTIONS

Conservation Behavior Classifications	Example Behavior Items	Scale for measuring responses	Sources
2.2 Environmental stewardship (continued)	I voluntarily carry out environmental actions and initiatives in my daily work activities.		
	I make suggestions to my colleagues about ways to protect the environment more effectively, even when it is not my direct responsibility.		
	I suggest new practices that could improve the environmental performance of my organization.		
	Our planet's waterways and environment are overflowing with litter, especially plastic. Can you commit today to safely clean up your neighborhood? Let's clean up our planet — one piece at a time.	Yes, No	Earth Day Network
3.0 Private-sphere conservation behaviors			
3.1 Resource sustainability / Green Passenger	Looked for ways to reuse things	never, rarely, sometimes, often, very often	Arnocky, S., Stroink, M., & DeCicco, T. (2007).
	recycled newspapers		
	recycled cans or bottles		
	composted food scraps		
	Conserved gasoline by walking or bicycling		
	Add new Rs - Remove, Refuse, Rally		Earth Day Network
	Reduce my plastic use	1-5 Scale: 1) Not at all, 2) Maybe someday I will do this, 3) I plan to do this, 4) I already do this some of the time, 5) I already do this as often as I can	Maynard et al. unpublished study
	Recycling resources (plastic, paper, etc.)		
	Reduce my pesticide and fertilizer use		
	I do not let the water tap run unnecessarily.	Every chance I had, Often, Sometimes, or Never	Ghazali, E. M., Nguyen, B., Mutum, D. S., & Yap, S. F. (2019).
	I am careful not to waste electricity in my daily activities.		
	I save water when washing my dishes.		
	I save water when I take a bath or a shower.		
	I save water when I wash my hands.		
	I turn off all lights before leaving the house or when they are not needed.		
	Recycle used batteries (i.e., car battery, phone battery, etc.)?		
	Sort trash for recycling purposes?		
	Make sure to throw away fishing lines after catching fish		

Conservation Behavior Classifications	Example Behavior Items	Scale for measuring responses	Sources
3.1 Resource sustainability / Green Passenger (continued)	Turn off faucet when brushing your teeth	Every chance I had, Often, Sometimes, or Never	Ghazali, E. M., Nguyen, B., Mutum, D. S., & Yap, S. F. (2019)
	Plug the sink when washing dishes to conserve water		
	Try reusable dishes or paper not Styrofoam		
	Use a reusable water bottle instead of a disposable one		
	Reuse plastic sandwich bags		
	Use reusable bags instead of paper or plastic ones		
	Take a shorter shower		
	Boil only enough water for what you need		
	Ride a bike or walk instead of riding in a car		
	Use both side of every piece of paper		
	Public transportation, such as the bus.		
	Public transportation, such as the train (KTM/LRT/MRT/Monorail).		
	Drive alone to work or school. (R)		
	Ride your bicycle to work or school.		
	Carpool (i.e., share a ride with others).		
	Ever practiced making own fertilizer at home?	Yes, No	Robertson & Barling (2013)
	Eating less meat		
	Eating local food		
	Driving less		
	Biking more		
	Print double-sided when possible		
	Can you call your utility company and ask for green power?		Earth Day Network
3.2 Sustainable purchases / Consumer behavior	Purchased products in reusable containers	never, rarely, sometimes, often, very often	Arnocky, S., Stroink, M., & DeCicco, T. (2007).
	I would be willing to give up convenience products and services I now enjoy if it meant helping preserve our natural environment.	strongly agree or disagree (1-5)	Stets and Biga 2003

Conservation Behavior Classifications	Example Behavior Items	Scale for measuring responses	Sources
3.2 Sustainable purchases / Consumer behavior (continued)	Increased efforts by business and industry to improve environmental quality could lead to higher consumer prices. Would you be willing to pay higher consumer prices so that industry could better preserve and protect the environment?	Every chance I had, Often, Sometimes, or Never	Stets and Biga 2003
	In the past several years, have you boycotted a company's products because of its record on the environment?	Every chance I had, Often, Sometimes, or Never	Stets and Biga 2003
	How often do you make a special effort to buy fruits and vegetables grown without pesticides or chemicals; also known as organic fruits and vegetables?	Always, Often, Sometimes, or Never	Stern 2000
	How often do you make a special effort to buy paper and plastic products that are made from recycled materials?		
	How often do you avoid buying products from a company that you know may be harming the environment?		
	How often do you make a special effort to buy household chemicals such as detergent and cleaning solutions that are environmentally friendly?		
	I would be willing to pay much higher prices in order to protect the environment.	Strongly agree, Somewhat agree, Somewhat disagree, Strongly disagree	
	Boycotted or avoided buying the products of a company because you felt that company was harming the environment?	Yes, No	
	Choosing sustainable food options	1-5 Scale: 1) Not at all, 2) Maybe someday I will do this, 3) I plan to do this, 4) I already do this some of the time, 5) I already do this as often as I can	Maynard et al. unpublished study
	Make your next meal plant-based.		
	Select items to purchase that support saving wildlife and are friendly to the environment		
	Buy items made from recycled goods and with less packaging	Every chance I had, Often, Sometimes, or Never	Ghazali, E. M., Nguyen, B., Mutum, D. S., & Yap, S. F. (2019).
	Buy products that come in a refillable container?		
	Buy products that are packaged in or made from recycled materials?		
	Use energy-efficient light bulbs?		

Conservation Behavior Classifications	Example Behavior Items	Scale for measuring responses	Sources
3.2 Sustainable purchases / Consumer behavior (continued)	Buy products that are certified as being environmentally safe?	Every chance I had, Often, Sometimes, or Never	Ghazali, E. M., Nguyen, B., Mutum, D. S., & Yap, S. F. (2019).
	Buy food that is organically grown (without pesticides or chemicals)?		
	Buy products that are biodegradable or that have biodegradable packaging?		
	Buy products that are produced by environmentally responsible companies?		
	Use less air-conditioning to save energy?		
	Purchase energy-efficient home appliances?		
	I use phosphate-free soaps and detergents.		
	I use biodegradable soaps/detergents at home.		
	I reuse office paper (e.g., for notes or printing drafts).		
	I use biodegradable plastic garbage bags at home.		
	I never use Styrofoam packaging.		
	Boycotted products or companies based on their environmental record?	Yes, No	
	Boycotted products because It came in an aerosol container?		
	Boycotted products because it was tested on animals?		
	Boycotted products because it used materials derived from threatened animal species?		
	Boycotted products because it causes damage to the environment?		
	Boycotted products because it had environmentally harmful packaging?		
	Boycotted products because it was treated with pesticides?		
4.0 Conservation behaviors direct to species and project			
4.1 Citizen science	Participate in citizen science	1-5 Scale: 1) Not at all, 2) Maybe someday I will do this, 3) I plan to do this, 4) I already do this some of the time, 5) I already do this as often as I can	Maynard et al. unpublished study

APPENDIX A: CONSERVATION BEHAVIOR OPTIONS

Conservation Behavior Classifications	Example Behavior Items	Scale for measuring responses	Sources
4.1 Citizen science (continued)	Walk through and observe the habitat and wildlife	Every chance I had, Often, Sometimes, or Never	Maynard et al. unpublished study
	Go on a bird hike; how many birds can you identify?		
4.2 Resource collection / and pro-species or pro-habitat behaviors	Picked up litter that was not your own	never, rarely, sometimes, often, very often	Arnocky, S., Stroink, M., & DeCicco, T. (2007).
	Picking up trash when I see it on the ground	1-5 Scale: 1) Not at all, 2) Maybe someday I will do this, 3) I plan to do this, 4) I already do this some of the time, 5) I already do this as often as I can	Maynard et al. unpublished study
	Create habitat in my backyard or community		
	Choose my pets wisely and care for them to reduce wildlife impacts		
	Build a bird or bat house	Yes, No	
	Plant trees or shrubs on the edge of the beach to help stop erosion	every chance I had, Often, Sometimes, or Never	
	Knock down sandcastles at the end of the day and fill in holes in the sand		
	Use designated areas for beach umbrellas		
	Leave seashells on the beach		
	Practice safe snorkeling, don't touch the coral		
	Not spraying pesticides on my lawn		
	Not having a lawn		
	Planting native plants		
	Planting wildlife-friendly plants		
	Keeping my cat indoors		
	Setting up bird feeders		
5.0 Pro-organization conservation behaviors			
5.1 Philanthropic funding	Donated money to an environmental group	never, rarely, sometimes, often, very often	Arnocky, S., Stroink, M., & DeCicco, T. (2007).
	In the past several years, have you contributed money to an environmental, conservation, or wildlife preservation organization?	Every chance I had, Often, Sometimes, or Never	Stets and Biga 2003
	Donated money to charities involved in	Yes, No	Ghazali, E. M., Nguyen, B., Mutum, D. S., & Yap, S. F. (2019).

Conservation Behavior Classifications	Example Behavior Items	Scale for measuring responses	Sources
5.1 Philanthropic funding (continued)	Given money to an environmental group?	Yes, No	Stern 2000
5.2 Volunteering	Volunteered time to help an environmental group	never, rarely, sometimes, often, very often	Arnocky, S., Stroink, M., & DeCicco, T. (2007).
	In the past several years, have you volunteered for an environmental, conservation, or wildlife protection group?	Every chance I had, Often, Sometimes, or Never	Stets and Biga 2003
	Donate my time or money to conservation organizations	1-5 Scale: 1) Not at all, 2) Maybe someday I will do this, 3) I plan to do this, 4) I already do this some of the time, 5) I already do this as often as I can	Maynard et al. unpublished study
	Volunteered your time for pro-environmental activities?	Yes, No	Ghazali, E. M., Nguyen, B., Mutum, D. S., & Yap, S. F. (2019).

Barriers are another complex concept to document independent of asking people to share their perceived barriers. Despite the potential limitations from this, such as the cognitive requirement of awareness and understanding about barriers to be able to report about them, self-reported barriers are more informative than designing programs without them.

Here's an example survey scale for documenting self-identified barriers across the Pathfinder Scale (Maynard et al. unpublished study):

Are there any barriers currently preventing you from taking conservation actions? Check all that apply:

- I need more knowledge about conservation actions
- I need more understanding about why they're important
- I need more understanding about the impact my own actions make I need more time
- I need more interest in the topic
- I need more opportunities to try out conservation actions
- I need more trainings/practice on the conservation actions
- I need more opportunities to hang out with other people interested in conservation
- I need more support from my leadership and/or team
- I need more support from friends/family
- I need more incentives (e.g., recognition, rewards, swag)
- I need more visible results from my conservation actions
- I need more knowledge about the benefits of conservation actions over my current actions
- I need more understanding about how conservation actions are compatible with my lifestyle
- I need clearer and Simplified conservation actions
- Nothing - I'm doing everything I can

Appendix B: Example Survey Scales for the 10 Pathways

Will + Way: Hope Scale

Factor	Source	Item	Scale
Willpower	The Snyder Hope Scale - (Snyder, Irving, & Anderson, 1991)	I energetically pursue my goals.	strongly agree to strongly disagree (1-5)
		My past experiences have prepared me well for my future.	strongly agree to strongly disagree (1-5)
		I've been pretty successful in life.	strongly agree to strongly disagree (1-5)
		I meet the goals that I set for myself.	strongly agree to strongly disagree (1-5)
Waypower	The Snyder Hope Scale - (Snyder et al., 1991)	I can think of ways to get out of a jam.	strongly agree to strongly disagree (1-5)
		There are lots of ways around any problem.	strongly agree to strongly disagree (1-5)
		I can think of many ways to get the things in life that are important to me.	strongly agree to strongly disagree (1-5)
		Even when others get discouraged, I know I can find a way to solve the problem.	strongly agree to strongly disagree (1-5)
Efficacy, trust, and confidence	The IHS (Schrang et al., 2011) HHI (Herth, 1992)	I have deep inner strength.	strongly agree to strongly disagree (1-5)
		Even when others get discouraged, I know I can find a way to solve the problem.	strongly agree to strongly disagree (1-5)
		I have a sense of direction.	strongly agree to strongly disagree (1-5)
		I can see possibilities in the midst of difficulties.	strongly agree to strongly disagree (1-5)
Hope for climate change	Li and Monroe 2018	1. I believe people will be able to fix global warming.	strongly agree to strongly disagree (1-5)
		2. I believe that research and technical solutions will help fix global warming.	strongly agree to strongly disagree (1-5)
		3. Forest landowners can make a difference in the climate by practicing good forest management strategies.	strongly agree to strongly disagree (1-5)
		4. Because people can change their behavior, we can influence global warming in a positive direction.	strongly agree to strongly disagree (1-5)
		5. I am hopeful about resolving global warming because more people are taking global warming seriously.	strongly agree to strongly disagree (1-5)
		6. I know that there are a number of things that I can do to contribute to global warming solutions.	strongly agree to strongly disagree (1-5)

Hope for climate change (continued)	Li and Monroe 2018	7. I am hopeful about global warming because I can think of many ways to resolve this problem.	strongly agree to strongly disagree (1-5)
		8. Global warming is such a huge problem and I don't think people can change it.	strongly agree to strongly disagree (1-5)
Personal-sphere will and way	Li and Monroe 2018	I know that there are a number of things that I can do to contribute to global warming solutions.	strongly agree to strongly disagree (1-5)
		I am hopeful about global warming because I can think of many ways to resolve this problem.	strongly agree to strongly disagree (1-5)
		Forest landowners can make a difference in the climate by practicing good forest management strategies.	strongly agree to strongly disagree (1-5)
		I am hopeful about resolving global warming because more people are taking global warming seriously.	strongly agree to strongly disagree (1-5)
Collective-sphere will and way	Li and Monroe 2018	I believe that research and technical solutions will help fix global warming.	strongly agree to strongly disagree (1-5)
		I believe people will be able to fix global warming.	strongly agree to strongly disagree (1-5)
		Because people can change their behavior, we can influence global warming in a positive direction.	strongly agree to strongly disagree (1-5)
		Global warming is such a huge problem and I don't think people can change it. (R)	strongly agree to strongly disagree (1-5)



Example: Climate Change Hope Scale (CCHS) from Li and Monroe 2018

Definition: Climate change refers to changes in the Earth's climate including changes in temperature, precipitation, and wind patterns over a period of several decades or longer, primarily due to the emission of greenhouse gases from burning fossil fuels and land-use change. It may cause problems such as changes in sea level, more extreme heat events, fires and drought, more extreme storms, and floods. Scientists project that the problems caused by climate change could affect, for example, forest health, agriculture, freshwater supplies, coastlines, human health, economy, wildlife habitat, and human migration.

- | | |
|----------------------|--|
| -3 Strongly disagree | 1 Slightly agree |
| -2 Disagree | 2 Agree |
| -1 Slightly disagree | 3 Strongly agree |
| 0 Neutral | X I do not think the climate is changing |

1	I believe people will be able to solve problems caused by climate change.	-3	-2	-1	0	1	2	3	X
2	I believe scientists will be able to find ways to solve problems caused by climate change.	-3	-2	-1	0	1	2	3	X
3	Even when some people give up, I know there will be others who will continue to try to solve problems caused by climate change.	-3	-2	-1	0	1	2	3	X
4	If everyone works together, we can solve problems caused by climate change.	-3	-2	-1	0	1	2	3	X
5	I am willing to take actions to help solve problems caused by climate change.	-3	-2	-1	0	1	2	3	X
6	I believe more people are willing to take actions to help solve problems caused by climate change.	-3	-2	-1	0	1	2	3	X
7	I know that there are things that I can do to help solve problems caused by climate change.	-3	-2	-1	0	1	2	3	X
8	I know what to do to help solve problems caused by climate change.	-3	-2	-1	0	1	2	3	X
9	Climate change is beyond my control, so I won't even bother trying to solve problems caused by climate change.	-3	-2	-1	0	1	2	3	X
10	Climate change is so complex we will not be able to solve problems that it causes.	-3	-2	-1	0	1	2	3	X
11	The actions I can take are too small to help solve problems caused by climate change.	-3	-2	-1	0	1	2	3	X

Appendix C: Pathway Examples

Pathway 1: Knowledge and cognitive processing

(Schultz 2002)
 (MacDonald, Milfont, Gavin 2016)
 (Festinger 1962)
 (Clayton et al. 2017)
 (Moss et al. 2014)
 (Kahan et al. 2012)

- Start by clearly defining the specific knowledge or skills you want to assess with your survey, ensuring that each question aligns with these objectives and measures relevant aspects of learning.
- Create a mix of question types, such as multiple-choice, true/false, and short answer, to effectively gauge comprehension and application of the material.
- Include reverse-coded questions—where a lower score indicates higher knowledge—to test users' attention and ensure they are carefully reading and responding to each item.
- Pilot test the survey with a small group to identify any ambiguities or issues before administering it to a larger audience, and revise accordingly based on feedback and preliminary results.

Pathway 2: Attitude toward the behavior

Attitude measurement

(Monroe, Crandall, Maynard 2021)

How concerned are you about the following issues that may be related to the health of Florida coastal waters? (where 1 = not at all concerned; 5 = very concerned)

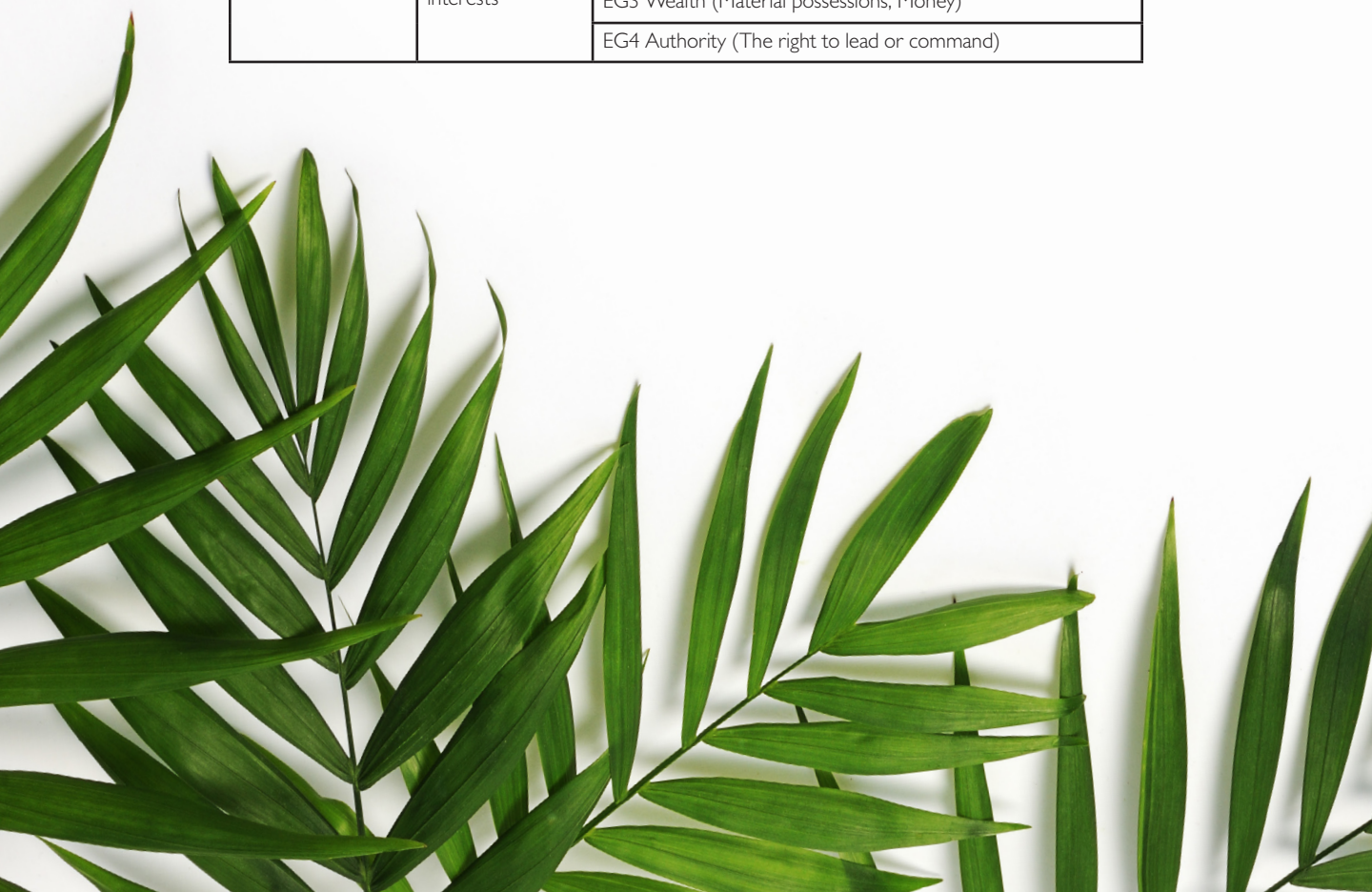
Eating fish and shellfish from this area	1	2	3	4	5
Swimming in the ocean	1	2	3	4	5
Boating in the ocean	1	2	3	4	5
Walking along the beach	1	2	3	4	5
Decline in property value	1	2	3	4	5
Decline in tourism	1	2	3	4	5
Decline in population	1	2	3	4	5
Changes in the ecosystem	1	2	3	4	5
Changes in community pride	1	2	3	4	5

Pathway 3: Values

Personal and Humanity impact measurement

(Ghazali, Nguyen, Mutum, Yap 2019)

Constructs and Sources	Description	Measurement Items
Altruistic Values [1,21,72]	Concerns other people and other living species	AL1 Equality (Equal opportunity for all)
		AL2 AWorld at Peace (Free of war/conflict)
		AL3 Social Justice (Correcting injustice, Care for the weak)
		AL4 Helpful (Helping others)
		AL5 Loyalty (Faithful to my friends)
		AL6 Honouring Parents and Elders (Showing respect)
Biospheric Values [1]	Concerns the biosphere, environment, and ecosystem	BV1 Preventing Pollution (Conserving natural resources)
		BV2 Respecting the Earth (Harmony with other species)
		BV3 Unity with Nature (Fitting into nature)
		BV4 Protecting the Environment (Preserving nature)
Egoistic Values [1,12,47,49,50]	Promotes short-term desires and long-term interests	EG1 Influential (Having an impact on people and events)
		EG2 Social Power (Control over others, Dominance)
		EG3 Wealth (Material possessions, Money)
		EG4 Authority (The right to lead or command)



Pathway 4: Personal norms, sense of responsibility, and identity

Personal Normative Beliefs measurement

(Gärling, Fujii, Gärling, Jakobsson 2003)

Constructs and Sources	Description	Measurement Items
Altruistic Values [1,21,72]	Concerns other people and other living species	AL1 Equality (Equal opportunity for all)
		AL2 AWorld at Peace (Free of war/conflict)
		AL3 Social Justice (Correcting injustice, Care for the weak)
		AL4 Helpful (Helping others)
		AL5 Loyalty (Faithful to my friends)
		AL6 Honouring Parents and Elders (Showing respect)
Biospheric Values [1]	Concerns the biosphere, environment, and ecosystem	BV1 Preventing Pollution (Conserving natural resources)
		BV2 Respecting the Earth (Harmony with other species)
		BV3 Unity with Nature (Fitting into nature)
		BV4 Protecting the Environment (Preserving nature)
Egoistic Values [1,12,47,49,50]	Promotes short-term desires and long-term interests	EG1 Influential (Having an impact on people and events)
		EG2 Social Power (Control over others, Dominance)
		EG3 Wealth (Material possessions, Money)
		EG4 Authority (The right to lead or command)

Please indicate your level of agreement with each statement by selecting the response that best matches your opinion.

Disagree strongly Disagree a little Neutral Agree a little Agree strongly

1. I feel an obligation to buy green products where possible.
2. I feel a strong personal obligation to use energy wisely.
3. I feel a moral obligation to protect the environment.
4. I feel that I should protect the environment.
5. I feel it is important that people in general protect the environment.
6. I feel I must do something to help future generations.
7. Because of my own values/principles, I feel an obligation to behave in an environmentally friendly way.
8. I should do what I can to conserve natural resources.
9. The government should take stronger action to conserve the environment of the region where I live.

10. I feel a personal obligation to do whatever I can to conserve Florida fisheries.
11. Business and industry should reduce their emissions to help conserve Florida fisheries.
12. The government should exert pressure across the state to preserve Florida fisheries.
13. People like me should do whatever we can to prevent the loss of Florida fisheries.

Pathway 5: Subjective / Social norms

(Ghazali et al. 2019)

Constructs and Sources	Description	Measurement Items
Social Norms [16,62,74]	Social pressures that an individual experience from significant others or from society at large to engage in a specific behavior	SN1 People I know buy green products.
		SN2 People I know are concerned about issues related to the environment.
		SN3 People I know think it is important to buy green products.
		SN4 People I know recycle those items that can be recycled.
		SN5 Most people who are important to me think I should purchase green products in place of conventional, non-green products.
		SN6 Most people who are important to me would want me to purchase green products in place of conventional non-green products.
		SN7 People whose opinions I value would prefer that I purchase green products in place of conventional non-green products.

The Trust Scale

(Li and Monroe 2018)

How much do you believe that the following types of people could help address problems caused by climate change?

- | | | | | | | |
|----------------------|---|---|---|---|---|---|
| a. Business leaders | 1 | 2 | 3 | 4 | 5 | U |
| b. Community leaders | 1 | 2 | 3 | 4 | 5 | U |
| c. Farmers | 1 | 2 | 3 | 4 | 5 | U |
| d. Forest landowners | 1 | 2 | 3 | 4 | 5 | U |
| e. Politicians | 1 | 2 | 3 | 4 | 5 | U |
| f. Scientists | 1 | 2 | 3 | 4 | 5 | U |

Pathway 6: Perceived behavioral control, direct experience, self-efficacy, and perceived ability to impact issue

Self-efficacy and capacity measurement

Self Efficacy Scale (Li, Monroe 2018)

How strongly do you believe that you...

- | | | | | | | |
|--|---|---|---|---|---|---|
| a. Know what to do to help solve climate change problems | I | 2 | 3 | 4 | 5 | U |
| b. Can take small actions that will make a difference | I | 2 | 3 | 4 | 5 | U |
| c. Will take actions to help solve climate change problems | I | 2 | 3 | 4 | 5 | U |

Self-efficacy question examples

Rate your degree of confidence in following safe sawfish handling procedures from 1 (not confident at all) to 5 (extremely confident).

I have enough knowledge on how to protect Florida fisheries (or Sawfish?).

I have the needed skills to protect Florida fisheries (or Sawfish?).

To what extent do you think a reduction in fisheries (and/or other variables we want to highlight like ecosystem health, sawfish populations) could be a problem for you and your family?

- | | | | | |
|------------------------|-----------------------------|--------------------------------|-------------------------------|------------------------------------|
| 1. | 2. | 3. | 4. | 5. |
| It won't be a problem. | It will be a small problem. | It will be a moderate problem. | It will be a serious problem. | It will be a very serious problem. |

To what extent do you think a reduction in fisheries (and/or other variables we want to highlight like ecosystem health, sawfish populations) could be a problem for the company where you work?

- | | | | | |
|------------------------|-----------------------------|--------------------------------|-------------------------------|------------------------------------|
| 1. | 2. | 3. | 4. | 5. |
| It won't be a problem. | It will be a small problem. | It will be a moderate problem. | It will be a serious problem. | It will be a very serious problem. |

To what extent do you think a reduction in fisheries (and/or other variables we want to highlight, ecosystems, sawfish populations) could be a problem for the state of Florida?

- | | | | | |
|------------------------|-----------------------------|--------------------------------|-------------------------------|------------------------------------|
| 1. | 2. | 3. | 4. | 5. |
| It won't be a problem. | It will be a small problem. | It will be a moderate problem. | It will be a serious problem. | It will be a very serious problem. |

To what extent do you think a reduction in fisheries (and/or other variables we want to highlight, ecosystems, sawfish populations) could be a problem for the United States?

1.
It won't be
a problem.
2.
It will be a
small problem.
3.
It will be a
moderate problem.
4.
It will be a
serious problem.
5.
It will be a very
serious problem.

To what extent do you think a reduction in fisheries (and/or other variables we want to highlight, ecosystems, sawfish populations) could be a problem for other species of plants and animals?

1.
It won't be
a problem.
2.
It will be a
small problem.
3.
It will be a
moderate problem.
4.
It will be a
serious problem.
5.
It will be a very
serious problem.

Pathway 7: Behavioral intention

Behavioral intention measurement

(Maynard et al. in review)

To what extent is your organization participating in these possible monarch conservation activities?

List of activities	Not at all	Maybe someday we'll do this at our organization	We plan to do this at our organization this year	We already do this at our organization	We already do this and we plan to increase our involvement in this activity this year
Activity A					
Activity B					
Activity C					

Pathway 8: Sense of place and significant life experience

Environmental Identity measurement

(Clayton 2003)

This next section asks about your view of nature and conservation in general. Please indicate your level of agreement with each statement by selecting the response that best matches your opinion.

	Disagree Strongly	Disagree a little	Neutral	Agree a little	Agree Strongly
When I am upset or stressed, I feel better by spending some time outdoors, connecting with nature	1	2	3	4	5
If I had enough time or money, I would certainly devote some of it to working for environmental causes.	1	2	3	4	5
I think of myself as part of nature, not separate from it.	1	2	3	4	5
I have a lot in common with conservationists as a group.	1	2	3	4	5
Being a part of the ecosystem is an important part of who I am.	1	2	3	4	5
I feel that I have roots with a particular geographic location that had a significant impact on my development.	1	2	3	4	5
Behaving responsibly toward the Earth – living sustainably – is very important to me.	1	2	3	4	5
Learning about nature should be an important part of every child's upbringing.	1	2	3	4	5
In general, being part of the natural world is an important part of my self-image.	1	2	3	4	5
I would feel that an important part of my life was missing if I were not able to get out and enjoy nature from time to time.	1	2	3	4	5
Interacting with nature is very important to me.	1	2	3	4	5
My own interests usually seem to coincide with the position advocated by conservationists.	1	2	3	4	5
I spend a lot of time in natural settings (woods, mountains, desert, lakes, ocean).	1	2	3	4	5
Engaging in environmental behaviors is important to me.	1	2	3	4	5
Living near wildlife is important to me; I would not want to living in a city all the time.	1	2	3	4	5
I believe that some of today's social problems could be cured by returning to a more rural life-style in which people live in harmony with the land.	1	2	3	4	5

APPENDIX C: PATHWAY EXAMPLES

I feel I have a lot in common with other species.	I	2	3	4	5
I like to garden.	I	2	3	4	5
I would rather live in a small room or house with a nice view than a bigger room or house with a view of other buildings.	I	2	3	4	5
I really enjoy camping and hiking outdoors.	I	2	3	4	5
Sometimes I feel like parts of nature – certain trees, or storms, or mountains – have a personality of their own.	I	2	3	4	5
I take pride in the fact that I could survive outdoors on my own for a few days.	I	2	3	4	5
I have never seen a work of art that is as beautiful as a work of nature, like a sunset or a mountain range.	I	2	3	4	5
I feel that I receive spiritual sustenance from experiences with nature.	I	2	3	4	5
I keep mementos from the outdoors in my room, such as shells, rocks, or feathers.	I	2	3	4	5

Salience of Environment Identity

How would you describe yourself to another when meeting for the first time.

Would you describe the environment or any connection to the natural world in your self-description ?

Commitment to Environment Identity

Have you joined any organization through activities related to your environmental role?

Have you made any friends through activities related to your environmental role?

How important is it to you that your friends view you as an environmentalist?

How important is it to you that your family view you as an environmentalist?

Sense of place measurement

(Place Attachment/Identity, and the Place Satisfaction/Attitude scales (Stedman 2002))

Answer the following questions about your relationship to the Indian River Lagoon: (7-point strongly disagree to strongly agree scale):

- I feel that I can really be myself there
- I really miss it when I am away too long
- I feel happiest when I am there
- It is the best place to do the things I enjoy
- It is my favorite place to be
- It reflects the type of person I am
- For the things I enjoy most, no other place can compare
- Everything about it is a reflection of me
- As far as I am concerned, there are better places to be

Answer the following questions about your satisfaction with these components of the Indian River Lagoon (5-point scale of extremely satisfied to extremely dissatisfied):

- Scenery
- Water quality
- Solitude / peacefulness
- Population of wildlife
- Number of users
- Level of shore development
- Other's recreation activities
- Fishing quality

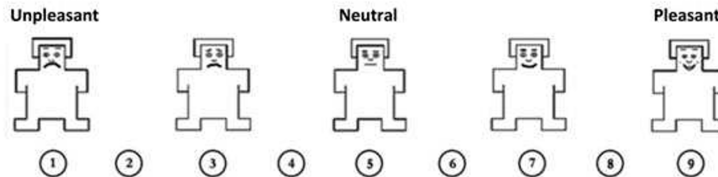
Pathway 9: Emotional affinity and empathy

Emotional reaction measurement

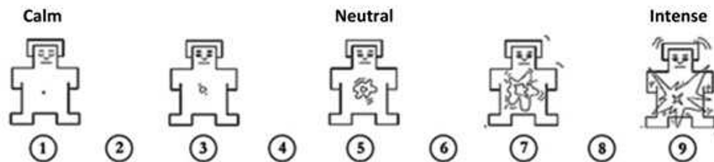
Self-assessment manikin (Jacobson et al. 2019; Maynard et al. in review):

For the next 3 questions, please select the number that best represents your response

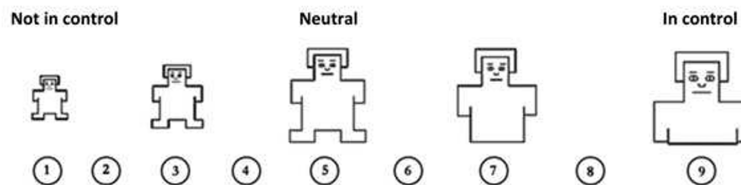
1. Please select the number that best represents your response to the video.



2. Please select the number that best represents your response to the video:



3. Please select the number that best represents your response to the video:



Pathway 10: Connector cues triggering action

Connector:

This factor does not have a specific question scale. Instead, you can test the effectiveness of this factor by comparing the successful messages to facilitate the desired behavior by using the presence of a connector cue or spokesperson for the action with other message strategies using the central cue / logical process (Factor 1).

Appendix D: Answers to Workbook Exercises

Awareness / Engagement Exercise

Question	Awareness	Engagement
Celebrating international okapi day at your facility	X	
An onsite energy reduction campaign at your facility		X
Zoo teens building bee home for placement in the field		X
Selling animal art at your facility to fund conservation efforts abroad		X
A teacher curriculum about rhinos for your state	X	
Citizen science and habitat restoration projects for amphibians		X
Creating a community soccer program in Madagascar to support radiated tortoises	X	
A fundraiser to support the Black Mambas anti-rhino poaching team		X
The public identifying animals on Snapshot Safari to help conservationists study wildlife populations		X
A community-based art cooperative that sells its art to tourists to provide income for the village instead of poaching to support the community		X



Appendix E: Example Evaluation of the Pathways to Motivate Conservation Action

Abstract

Convincing people to adopt pro-environmental behaviors is integral to conservation. Changes in behaviors such as replacing detrimental actions with alternatives or encouraging entirely new, positive activities can be promoted by message framing using social science. But reaching diverse audiences with inspiring and relevant messages to encourage conservation action is a complex challenge. Diverse, inter-, and multi-disciplinary scientists have widely explored mechanisms to influence motivation to act. We need to integrate the social sciences' research findings into conservation science and practice to uncover effective ways to promote conservation. In this study, we first conduct a qualitative content analysis to review overlapping themes across the abundant, interdisciplinary conservation behavior change theories to then populate a quantitative survey for direct comparison of predicted motivational factors. Using Chi-squared tests, correlations, ANOVA and regression analyses, we test the survey with a large online sample (N=4558) around the globe (including more than 500 people on each continent but Antarctica) to document motivational preferences toward conservation action. Resultant differences in preferences of the messages across the twelve distinct conservation frames highlight the diversity of connections in global audiences; one message cannot work to motivate all audience members. These results reveal opportunities to design interventions to motivate conservation action which will engage our diverse target audiences. Differences by region and respondent demographics reveal additional considerations to make when applying the Pathways Framework to mobilize audiences to take action for conservation.

Introduction

Conservation depends on human actions (Schultz, 2011). Almost all environmental problems are consequences of human behaviors, thus we are the only species that can mitigate the stressors and enable conservation (Balmford & Cowling, 2006; Bowie et al., 2020). With increasing global climate and biodiversity crises, we urgently need active, widespread participation in environmental protection and resource sustainability (Selinske et al., 2018). But reaching diverse audiences with inspiring and relevant messages to encourage conservation action is a complex challenge needing the social sciences to inform their design and evaluation and improve their likelihood of mobilizing more people and resources (Bennett et al., 2017; Toomey, 2023; Thomas-Walters et al., 2023).

Convincing people to alter their existing habits and instead adopt pro-environmental behaviors is integral to conservation (Byerly et al., 2018). Human-driven threats to the environment must be addressed and solutions to problems can be more efficient with more people involved (Maynard et al., 2020). Whether using campaigns designed for a targeted audience or widespread messages throughout a community, conservation is an active concept contingent on motivating new participants to act (Schultz, 2011). Changes in behaviors such as replacing detrimental actions with alternatives or encouraging entirely new, positive activities can be promoted by message framing using motivation science (Cheng, Woon, & Lynes, 2011). Conservation behaviors can be fostered in multiple ways. Environmental education seeks to cultivate environmental literacy to encourage conservation action in the general future (Monroe, 2003). Alternatively, communications and social marketing techniques work to influence specific behaviors and enable action to address specific conservation issues (McKenzie-Mohr, 2011). This study focuses on examining the latter, specific-behavior route to assess opportunities to improve efficacy of community engagement in conservation marketing campaigns.

Diverse, inter-, and multi-disciplinary scientists have widely explored mechanisms to influence motivation to act (Balmford et al., 2021). The natural and social sciences can converge to apply research findings and assess message framing opportunities to promote conservation and sustainability (Saunders, 2003, 2006; Bennet et al., 2017). While information can help at times (e.g., Fisher et al., 2009), knowledge of an issue is not enough to ensure people take-action (Kahan et al., 2012; Toomey, 2023). Other factors

including human biases, individual interests, or social contexts can influence whether someone acts or not (Byerly et al., 2018; McKenzie-Mohr, 2011; Schultz, 2011). For example, motivation to take-action can be promoted by a variety of factors, including perceived costs and benefits (Nilsson et al., 2016; Steg and Vlek, 2009), values (Stern, 2000), identity (Clayton, Fraser, and Burgess, 2011), social norms (Ajzen, 1985), and self-efficacy (Bandura, 1977), among others. Each theory, framework, or model is a different lens for interpreting people's complex motivations. These lenses can be used in the hope of predicting or influencing behaviors in the future. See Heimlich and Ardoin (2008) for an literature review of conservation behavior theories.

However, the abundant behavior change theories can overwhelm conservationists when designing engagement campaigns. Selecting from the many frameworks to design message framing to motivate conservation action can be daunting without extensive social science training and expertise to determine relevant models. In this study, we examined opportunities for simplified best practices for motivational message design for conservation action campaigns by assessing the range of and the potential for overlap between behavior change theories.

Many researchers have established useful considerations for designing behavior change-focused social marketing campaigns. Promoting specific behaviors can be more effective than broad requests for generic support (Schultz, 2011). Additionally, reviewing the range of possible conservation activities that might engage the audience can reveal new behavior opportunities to diversify the menu (Maynard et al., 2020). Best practices in formative design encourage evaluating educational, persuasive, and structural interventions to determine effectiveness or opportunities for improvement (Graeff, 1999; McKenzie-Mohr, 2011; Thomas-Walters et al., 2023). While acknowledging these influential practices in campaign design, we see the complex field of numerous theories about individual and societal drivers of behavior (e.g., Steg and Vlek, 2009) as clouding the path to impact. Thus, we conducted this complementary study focused on illuminating consistent themes in motivational factors for conservation behavior change messages across the theories, no matter which behavior is being promoted.

In this study, we conducted a qualitative content analysis to review overlapping themes across conservation behavior change theories and populate a quantitative survey for direct comparison of predicted motivational factors. We examined the survey's representation of the many dimensions of motivation predicted by the interdisciplinary behavior change theories, then we tested the survey with a large sample around the globe to document diverse motivational preferences toward conservation action.

Methods

We conducted this study in 3 phases: 1) instrument development, 2) pilot testing and clarification, 3) global sample testing of the final Pathways Framework.

Instrument Development

During Phase 1, we compiled behavior change theories, frameworks, and models via a literature review across a range of disciplines including conservation psychology, environmental science, natural resource and wildlife management, communications, marketing, environmental and conservation education, sociology, political science, health and medicine, and business. An iterative process of dialogue between the researchers and 12 expert panelists across the range of relevant disciplines allowed the researchers to review, edit, and improve the list of relevant multidisciplinary theories. The literature review and expert input culminated in 34 theories, each adding to a consensus of currently known, evidence-based factors that can influence conservation behavior (Table 1).

The researchers then grouped the factors from the 34 theories into related themes through qualitative content analysis (Saldana, 2016). By grouping the factors measured in the survey instruments for each of the theories into overlapping topics, we pulled out distinct theoretical themes predicted by the multi-disciplinary literature review that significantly influence conservation behaviors. In cases when the researchers disagreed about statements' grouping, we discussed our reasoning and the interpretations of the statements as a group until we achieved intercoder agreement (Hodson, 1999). By consolidating example survey statements from each theory into groups of statements documenting similar qualitative concepts, the researchers discovered 12 constructs, what we call 12 Pathways to motivate conservation action (Table 1).

Survey statements representing key components of each of the 12 Pathways were selected from the published survey scales from the 34 theories. The lists of potential statements were categorized by the multi-faceted dimensions of each qualitative Pathway, so as not to lose the nuanced components of the constructs when compiled from the different theories. Then, the research team pared down the

measurement scale options into 9 survey statements for each of the 12 Pathways for a total of 108 statements (Full survey scale available in the Supporting Information Table 1). Statements were randomly paired for direct preferential comparison in 54 questions with responses on a scale from 1 to 5. For each pairing, respondents were asked to:

"Read both and then select the statement that best resonates with you. Choose 1 or 5 if the nearest statement clicks with your perspective, select 2 or 4 if you're leaning toward one statement but still consider the other like you, or select 3 if you identify equally strongly between both statements, or are neutral."

Pilot Testing

During Phase 2, we conducted a focus group with a panel of conservation practitioners including conservationists, communicators, scientists, and environmental educators to review the concepts of distinct motivational factors and clarify differentiating definitions of the 12 Pathways. We discussed participants' reactions to the Pathways and their perceptions of the 9 survey statements representing each Pathway to edit the definitions to be clearer and distinctive.

We conducted a survey pilot test with 35 people to assess the survey method, question structure, and respondents' perceptions of their results. Qualitatively discussing areas of agreement and dissonance using respondents' results was helpful for the pilot test to further improve distinguishing characteristics of the Pathways using clear language for non-experts. After reviewing the 12 Pathways and the respondents' results that revealed their preferred conservation communication pathways, the pilot test respondents were vocally positive, supportive, and intrigued by the diverse results in the group as well as their new understanding of their own motivation and communication preferences. However, the respondents found the 54 questions tedious with paired comparisons and recommended shortening the survey.

As such, we revised the survey from 54 questions with paired comparisons into 27 questions with random groups of 4 statements from the Pathways (Scale available in the online Supporting Information Table 2). Rather than a 5-point Likert scale of preferences, the respondents were asked to rank the 4 statements from the one they most identify with to the one they least relate to. Specifically, the new survey question structure asked:

"Below are a series of statements comparing messages about wildlife conservation. Please read the 4 messages per question carefully, then drag and drop one statement into each of the 4 boxes:

4. The message that MOST matches your perspective and clicks with your identity
3. The message that somewhat matches your perspective
2. The message that somewhat clashes with your perspective
1. The message that LEAST matches your perspective nor clicks with your identity."

A second round of pilot testing with 33 participants found the shorter survey to take less time and continued to consistently identify and differentiate preferences for the 12 Pathways for conservation motivation. A final focus group was held with these 33 respondents to discuss comprehension, questions, and construct validity. The research team reviewed word choice when confusion arose to edit statements for clarification and the survey was finalized. The Pathways Framework final survey is available in the Online Supplemental Information Table 2.

Global Sample Testing

During Phase 3, we conducted a global survey via the online survey software Qualtrics using Amazon Mechanical Turk to access a large population of diverse people across a range of regions and demographics, similar to Krause & Bucy (2018). These workers in the online platform are not predicted to have an environmental motivation for their participation, removing potential bias toward messaging preferences or connections to conservation, e.g., past experiences. Respondents were compensated with \$0.70 for their voluntary participation, which is a similar pay rate to other tasks with the same estimated timeframe for completion. Individual workers on the Amazon platform could only choose to participate in the survey once, and all members of the online workforce had access to participate until the maximum of 5000 participants was reached, including focused recruitment of at least 500 people on each continent but Antarctica. Conducting the global survey on this platform sought to compare diverse responses to the 12 Pathways and inform any differences between people's preferred motivations for conservation action.

We measured several demographic variables for deeper analysis of participant characteristics. These close-ended, multiple-choice items included: age in increments of 18-29, 30-39, 40-49, 50-59, 60-69, and more than 70 years old; highest level of schooling completed with the options being less than a high school diploma, a high school diploma or GED, some college or 2-year degree, Bachelor's degree

(e.g., BA, BS), Master's degree (e.g., MA, MS), Professional degree (e.g., Law, MD, DVM), or Doctorate (e.g., PhD, EdD); household income in 2019 in incremental options of \$50,000 or less, \$50,001-\$100,000, \$100,001-\$150,000, or more than \$150,001; gender with the options of male, female, other, or prefer not to answer; and race or ethnicity with participants asked to select all that apply from the options of white, black or African, Native or Indigenous, Asian, and Hispanic or Latino, or prefer not to answer; politics with conservative, moderate, liberal, or prefer not to say; religion with religious, not religious, or prefer not to say; and geographic continent with Africa, Asia, Europe, North America, Oceania, and South America.

Additionally, we measured respondents' willingness to take conservation action by asking them to self-report their intentions around 13 conservation behaviors on a 0-4 scale of Not at all (0), Maybe someday I will do this (1), I plan to do this (2), I already do this some of the time (3), and I already do this as often as I can (4). The Institutional Review Board at Miami University reviewed and approved the survey and study protocol for ethics in human subjects' research (reference number: 03606e).

Data Analysis

Across the 27 questions, we calculated the average score for each pathway based on the rankings given by the respondents. We checked for correlations among the pathways prior to performing any regression analysis. To evaluate the relationship between rankings and pathways, we performed a Chi-square test. We further tested the differences in pathway ranking across the various levels of respondent demographics using ANOVA. We identified the top 3 behaviors that respondents were most likely to adopt and performed ordinal regression analysis to identify which pathways influenced respondent decision-making and willingness to adopt these pro-environmental behaviors. We first did a stepwise regression to reduce the number of competing variables. Next, we built a set of models corresponding to all possible combinations of the candidate variables using the MuMIn package (Bartoń, 2019). We identified the best-fit models based on the Akaike Information Criterion (AIC; Burnham and Anderson 2002). We conducted model averaging when there were multiple models that were within $\Delta AIC \leq 2$ of the lowest AIC (Burnham et al., 2011). In the analysis, the variables that significantly influenced the dependent variable were identified based on a 95% confidence interval (CI) that excluded zero. This allowed us to determine whether the influence was positive (if the 95% CI contained only positive values) or negative (if the 95% CI included negative estimates). We considered coefficients to be statistically significant at $p \leq 0.05$. We performed all statistical analysis with R version 4.2.1.

Results

The 12 Pathways that we identified were selected after the research team consolidated example survey statements from each theory into groups of items measuring similar qualitative concepts (Table 1). Several pathways focused on cognitive concepts of understanding the topic or the behavior with the "Knowledge" pathway, connecting with impacts on the people, humanity, and/or the planet with the three Values pathways ("Personal Impact," "Humanity Impact," and "Planet Impact," respectively), and one's understanding of how to do the behavior with the "Capacity" pathway. Other pathways touched on one's beliefs and perceptions, including the "Attitudes" pathway assessing one's connection or caring for the topic or behavior, the "Identity" pathway for one's sense of responsibility and personal norms, the "Social" pathway representing others' opinions, actions, and perceived social norms, and the "Intention" pathway about one's commitment to do the potential action. Lastly, the final pathways used non-cognitive or external cues. The "Place" pathway integrated one's commitment to a place whether it be a pivotal geographic location, past experience, or an ecosystem where one does a preferred recreation. The "Emotion" pathway focused on the emotional messages that can influence one's motivations. And finally, the "Connector" pathway encompassed cues that one may react to positively without time or capacity for cognitive understanding about the topic or behavior, yet the conditions can be set to motivate the target pro-environmental behavior. The full list of 108 statements for the Pathways Framework used in the first-round, 54-question survey can be found in the Supporting Information available online, in addition to the Phase 2 grouped survey with 27 questions ranking 4 statements each.

The global survey sampled 5385 people across 6 continents and 69 countries, though the Pathways analysis reduced the sample size to 4865 after removing people with missing responses, and the ordinal regression analysis had 4857 complete responses.

The global survey revealed that respondents react differently to various environmental messages, leading to varying rankings across the 12 pathways (Table 2). A lower mean score suggests a stronger connection to the pathway. Notably, the pathways for "Social," "Planet Impact," and "Humanity Impact" received the lowest mean scores and were ranked highest by the majority of respondents. Conversely, the

pathways for “Connector,” “Knowledge,” and “Intention” had the highest mean scores, with “Connector,” “Emotion,” and “Intention” being least connected to by most respondents, ranked as the 12th pathway. The lowest mean and highest rank for “Social” pathway corroborates the importance of this pathway for the respondents. Similarly, “Connector” has the highest mean score, again indicating the most people gave it low rank.

To analyze the overall distribution of rankings across all pathways, an overall Chi-squared test resulted in χ^2 (df=121, $N = 4865$) = 4326.9, $p < 2.2e-16$. The significant result ($p < 0.05$) suggests that the observed distribution of rankings across pathways is unlikely to occur by chance alone, indicating the presence of an association between rankings and pathways created by the respondents. However, this test does not specify which pathway(s) contribute to the significant association, leading to a Chi-squared analysis of the distribution of rankings within each pathway (Table 3) to assess whether the rankings differ from a uniform distribution (i.e., randomness). The significant results ($p < 0.05$ across all pathways) suggest that the observed distribution of rankings for each pathway is unlikely to occur by chance alone, indicating the presence of a non-random pattern or trend in how respondents ranked each pathway (Table 3).

The correlations between the rankings of the 12 pathways are low across all of the pairings at less than < 0.22 across the board (See Supporting Information Online, Table 3). These low correlations demonstrate that the pathways by themselves are unique and none of the pathways can be replaced by another.

The large global survey sample enabled ANOVA multiple regression analyses examining how demographic factors such as geographic continent, age, income, education, gender, race, marital status, religion, and politics relate to the mean ranks of respondents for each of the 12 pathways (Table 4). The analysis revealed numerous statistically significant effects of predictor demographic variables on the mean scores across the range of the pathways, indicating variations in respondent perceptions based on demographic characteristics (Table 5). The demographic variables of religion significantly influenced responses for all 12 of the pathways. The pathways “Attitude,” “Social” and “Connector” were significantly influenced by all demographic predictors considered in the study.

The respondents varied in their willingness to do the 13 offered conservation behaviors and some behaviors were selected more often than others (Table 5). Recycling, behaving responsibly around wildlife, and reducing plastic use were most commonly selected with the highest mean scores. On the other hand, creating habitat, volunteering time, or donating money to a conservation cause were the least selected behaviors with the lowest mean scores. However, conservation actions are widespread in this global sample because all 13 of the behaviors had hundreds of respondents state they “already do this as often as [they] can” and thousands selected that they “already do this some of the time”. Hundreds of respondents also selected that they “plan to do” these conservation behaviors and could be inspired with more engagement or guidance from conservationists.

The 12 pathways varied in their predictions of the respondents’ willingness to take conservation actions (Table 6). Across the three behaviors most selected by the respondents, five of the pathways positively predicted an increase in the likelihood of doing the actions when the respondents aligned with that pathway; with an increase in the pathway score for “Attitudes”, “Social” support, caring about “Humanity Impact” and “Planet Impact”, and a sense of “Responsibility” (for the wildlife behavior only), the ordinal regression predicted an increase in the likelihood to do the conservation behaviors (Table 6). On the other hand, several of the pathways resulted in negative predictions for the likelihood of doing the actions when the respondents aligned with the pathways of “Capacity”, “Emotion”, “Personal Impact”, “Connector”, and “Place.” The stepwise selection of variables led to a few pathways having no significant influence on the likelihood to do some behaviors and therefore, did not appear in any of the top models (Table 7).

Discussion

Diverse audiences have varied motivations. Framing conservation messages using motivations relevant to the target audiences can strategically encourage more participation in conservation actions (Bowie et al., 2020; Toomey, 2023). Widespread, multi-disciplinary research studies have revealed plentiful lenses for interpreting influential factors for encouraging behavior change (Balmford et al., 2021; Byerly et al., 2018; Heimlich & Ardoin, 2008). In this study, we compared and summarized the numerous theories to assess opportunities for paring down the list into succinct, useful pathways for designing messages to motivate action in environmental conservation.

Our qualitative literature and expert reviews uncovered 12 distinct motivational pathways as constructs linking components of 34 diverse theories. The iterative process of quantitative survey development, pilot testing, respondent discussion, and editing for clarification resulted in a novel survey

comparing distinct motivational statements across the 12 pathways. The low correlations between the 12 pathways highlight that the concepts represented are unique and none of the pathways can be replaced by another. The paring down of the survey from 54 questions with paired statements to 27 questions ranking four statements each increased efficiency of collecting the same data to make the survey instrument easier for replication by conservationists seeking to understand their target audiences' perspectives and priorities before designing targeted messages to motivate conservation actions. The additional items of respondent demographics and willingness to do conservation behaviors demonstrate further opportunities for audience assessments to identify significant variables with which conservationists can intentionally design their calls-to-action. This study built on other literature reviews and assessments of interventions on conservation behaviors (e.g., Byerly et al., 2018; Balmford et al., 2021; Toomey, 2023) with novel integration of theories and disciplines to improve the rigor of the impact evaluation needed to improve conservation programs' potential effectiveness (Thomas-Walters et al., 2023).

The results of the global sample showed that respondents react to different environmental messages in diverse ways with the nonrandom and non-uniform rankings across the 12 pathways. The large global sample enabled a rigorous assessment of influential factors, as needed in the conservation field with a dearth of rigorous impact evaluation (Byerly et al., 2018; Thomas-Walters et al., 2023). The respondents' rankings were based on their interpretations of the statements and their prioritization of which they aligned with more strongly. When conservationists connect their call-to-action messages with social science evidence of their audience's interests and willingness to do the target behaviors, they can increase their success in engaging these audiences (Nageotte et al., 2024). While the pathways focused on "Social," "Planet Impact," and "Humanity Impact" were the highest ranked by the most people, and "Connector," "Knowledge," and "Intention" received lower rankings, all the pathways received some top ranking by respondents. Thus, the diverse menu of message framing opportunities across the 12 Pathways are all potentially relevant to a target audience and should be considered by conservationists before moving forward with the design of call-to-action messages. Using the Pathways Framework can inform what messages are relevant to an audience (Thomas-Walters et al., 2023); strategic messages are more effective than broad awareness dissemination (Toomey, 2023). Integration of the Pathways Framework with additional environmental threat analysis and behavior prioritization procedures (e.g., Balmford et al., 2021) could further align common conservation planning practices with strategic messages to connect with motives, values, norms, and identities measured in the 12 Pathways.

The nine demographic variables examined in the global sample revealed many statistically significant effects on the pathways' mean scores. The "Social" and "Connector" pathways were significantly affected by all nine predictor variables, highlighting opportunities for future research about the differences in reactions by audience members with diverse identities with the influence of cognitive, affective, and contextual factors on responses (Steg & Vlek, 2009; Heimlich & Ardoin, 2008). For example, Byerly et al. (2018) found in their review of 160 interventions that social norms and simple contextual adjustments making the behavior more accessible for people ready to act influenced pro-environmental decisions. Additionally, religion significantly influenced responses for all 12 of the pathways, so these demographic variables could be important to consider for other conservationists seeking to strategically reach their audiences as found when other studies of the influence of religion and politics on reactions to controversial topics (e.g., Drummond & Fischhoff, 2017). All the demographic variables may be relevant to different conservation projects, but we encourage future researchers to consider the applicability of these results and which of the nine variables are needed to examine influential and feasible factors in a target audience.

Responses about willingness to take different conservation actions differed. Every behavior had some active participants across the global sample, others interested in participating, and others not at all. This range emphasizes that a menu of behavioral options is important to consider by conservationists seeking to mobilize audiences when people might find different behaviors accessible or of interest. Yet, with thousands of people stating that they plan to try out the actions, conservationists have potential audiences primed for participation who could be reached with targeted messaging. When designing messages to promote conservation, promoting a single, specific action rather than broad educational concepts related to conservation will be better remembered and activated by the audience (Nageotte et al., 2024). Furthermore, co-designing interventions with target audience members while measuring the Pathways Framework could identify their pathways and behavioral motivations at the same time as building buy-in to increase the likelihood of participation in the conservation behavior (Bowier et al., 2020).

The 12 Pathways varied in their predictions of the respondents' willingness to do the conservation actions. The structure of the survey item may have influenced these results because some of the pathways may be better aligned with perceived social desirability the self-reporting of behavioral intention to promote positive, significant results (Grajal et al., 2017). Additionally, the survey question stated behaviors for

respondent reactions and did not frame them with the 12 pathways as an intentional message to influence responses, so all 12 of the pathways cannot be expected to have significant results independent of the question design. However, people aligned with some Pathways had positive associations with the behaviors, meaning the behaviors might feel more accessible to people with strong "Attitudes," "Social" support, caring about "Humanity Impact" and "Planet Impact," and a sense of "Responsibility" (for one behavior). On the other hand, the simple self-report question did not frame messages to encourage these actions for those who need to feel "Capacity" and self-efficacy, "Emotions," connection to "Personal Impact," "Connector" cues, or sense of "Place," since none of these are elicited in the question. With the "Knowledge" pathway eliminated by the ordinal regression process, the question framing with zero supporting information did not engage respondents who prefer knowledge and cognitive processing to make their decisions. Overall, such self-reported data is accessible for large-scale survey methods, but the results may be influenced by respondents' perceived social desirability of certain answers (Milfont, 2009). After using the Pathways Framework to understand an audience's motivations, researchers can use additional methods to inform intervention design to better mobilize the audience with additional engagement and co-design (Bowie et al., 2020) and ensure they inspire conservation actions that will address the threats driving the environmental problem (Balmford et al., 2021).

Future Research

We present the Pathways Framework in the hopes it can be applied and tested in a variety of conservation projects and contexts for improvement. With the complexities of both individual people and the communities we reside in, the human dimensions of conservation depend on people testing and measuring impact. Results can be brief, modest, or context-dependent (Balmford et al., 2017), so reporting out results across diverse environmental issues (e.g., species, landscapes, etc.), in different contexts (e.g., geographies, cultures, etc.), and influence on responses to different conservation actions (e.g., habitual or recurrent behaviors vs. novel, one-off actions, etc.) will be important to inform improvements on the Framework. Future research can explore the influential factors in the variety of conservation issues and contexts to further illuminate trends in target audiences to improve strategic call-to-action messaging. We encourage collaborations between social scientists and conservation practitioners to integrate the Pathways Framework with other metrics and community interventions.

Limitations

We expect the study results could have been limited by the extensive literature review, data collection design, and complex results. First, scientific literature is regularly growing, so we expect we may have missed other relevant research to include in the design of the Pathways Framework. However, we hope the snowball sampling and expert consensus focus groups across multiple disciplines reduced this potential shortfall. Second, the data collection could have influenced the global results because the survey was conducted only in English and data was collected online with the large population of participants of Amazon Mechanical Turk who were compensated \$0.70 for their participation. While we required at least 500 participants from each continent but Antarctica to have a widespread sample, English-speaking and access to internet participation may have biased the results to more educated or wealthy participants. The large sample independent of environmental interests allowed for a stronger comparison, yet the online sample has potential biases from respondents choosing to participate or not and perceiving social desirability of some responses based on their compensation for participation (Grajal et al., 2017). Thus, the third limitation is that the large sample and complexity of the results limited our space for detailed analysis and interpretation of the relationships between the demographic factors, the 12 Pathways, and the willingness to participate in the conservation behaviors. Future research using the Pathways Framework can examine the differences and relationships between these pathways further, depending on the focus of conservationists to engage target communities.

Conclusions

This study offers a framework for audience evaluation to identify motivations that can be integrated into strategic conservation messages. To effectively promote environmental conservation, we need to inspire people to decide to participate in specific conservation actions. The Pathways Framework based on multi-disciplinary social science highlights the range of motivations that can influence people's likelihood of participating in conservation. As shown by the diversity of respondents' preferences in the global sample, the menu of message frames across the 12 Pathways Framework can be integrated into conservation practices and tested with this survey to inform more specific messages to reach target audiences. The Pathways Framework can be applied by conservationists around the world for application

to a range of environmental issues, community contexts, and desired behaviors to identify opportunities to engage target audiences to take action and enhance conservation interventions by mobilizing more people and resources.

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Supporting Tables for Appendix E Pathways Evaluation

Table 1: The Pathways Framework of 12 motivations for conservation action as distinct, thematic constructs and the theories whose factors were grouped since they predict similar ways to influence behaviors.

#	Pathways	Theories with relevant factors contributed to each Pathway
1	Knowledge and cognitive processing	• Knowledge-Deficit Disorder (Schultz, 2002) • Elaboration Likelihood Model (central route), (Cacioppo & Petty, 1994); • Diffusion of Innovation (innovation characteristic #3 – simple over complex) (Rogers, 1995); • Cognitive Dissonance (Festinger, 1957; Aronson, 1997) • Sense of Coherence (Antonovsky, 1993) • Cognitive Heuristics (Kahneman & Tversky, 1996)
2	Attitude toward the behavior / topic	• Theory of Planned Behavior (Ajzen, 1985); • Value-Belief-Norm Theory (Stern, 2000); • Diffusion of Innovation (innovation characteristic #1 – relative advantage) (Rogers, 1995); • Environmental Concern (Arnocky, Stroink, & DeCicco, 2007); • Attitudes and behavior (Fazio, 1986, 1990)
3	Planet impact	• Value-Belief-Norm Theory (Stern, 2000); • Environmental Concern (Arnocky, Stroink, & DeCicco, 2007); • Environmental Values (Dietz, Fitzheral, & Shwom, 2005); • Value-Attitude-Behavior model (Vaske & Donnelly, 1999)
4	Humanity impact	• Value-Belief-Norm Theory (Stern, 2000); • Environmental Concern (Arnocky, Stroink, & DeCicco, 2007); • Environmental Values (Dietz, Fitzheral, & Shwom, 2005); • Value-Attitude-Behavior model (Vaske & Donnelly, 1999)
5	Personal impact	• Value-Belief-Norm Theory (Stern, 2000); • Environmental Concern (Arnocky, Stroink, & DeCicco, 2007); • Environmental Values (Dietz, Fitzheral, & Shwom, 2005); • Value-Attitude-Behavior model (Vaske & Donnelly, 1999)
6	Identity and personal norms	• Norm Activation (Schwartz, 1977); • Identity theory (Stets & Burke, 2000); • Environmental Identity (Clayton, Fraser, & Burgess, 2011); • Sense of Responsibility (Kaiser & Shimoda 1999); • Diffusion of Innovation (characteristic of innovation #2 – compatibility) (Rogers, 1995); • Reasonable Person Model (Kaplan & Kaplan, 2009); • Self-determination (Deci & Ryan, 2002, 2008); • Self-regulation (Sansone, 2000, 2005)

7	Social norms and subjective norms	• Theory of Planned Behavior (Ajzen, 1985); • Social Identity (Stets & Burke, 2000); • Community-based Social marketing (McKenzie-Mohr, 2011); • Diffusion of Innovation (innovation characteristic #5 – observability) (Rogers, 1995); • Persuasion (Cialdini, 2021); • Social capital (Adler & Kwon, 2002)
8	Capacity and self-efficacy	• Self-efficacy and outcome expectancy (Bandura, 1977); • Hope theory (Snyder, Rand, & Sigmon, 2001); • Theory of Planned Behavior (Ajzen, 1985); • Direct Experience (Millar & Millar, 1996); • Value-Belief-Norm theory (Stern, 2000); • Diffusion of Innovation (innovation characteristic #4 - Trialability) (Rogers, 1995); • Learned helplessness (Hiroto & Seligman, 1975)
9	Intention to do the behavior	• Theory of Planned Behavior (Ajzen, 1985); • Diffusion of Innovation (Rogers, 1995); • Stages of Change / Transtheoretical Model (Prochaska & DiClemente, 1983, 1992, 2008); • Persuasion (Cialdini, 2001, 2016)
10	Place and experience	• Sense of Place (Tuan 1977; Jorgenson & Stedman, 2001); • Significant Life Experience (Chawla, 1998); • Environmental Activism (Seguin, Pelletier, & Hunsley, 1998)
11	Emotions	• Emotional Affinity (Kals & Schumacher, 1999); • Empathy (Schultz, 2000)
12	Connectors and responses to cues	• Elaboration Likelihood Model (peripheral route; Petty & Priester, 1994); • Diffusion of Innovation (Rogers, 1995); • Community-based Social Marketing (McKenzie-Mohr, 2011); • Persuasion (Cialdini, 2001, 2016); • Reactance (Brehm & Brehm, 2016)

Table 2: Average, standard error, and the number of respondents corresponding to rankings for each of the 12 pathways with ranks closer to 1 indicating the strongest pathway with which the respondent aligned.

#	Pathway	Mean	SE	Rankings											
				1	2	3	4	5	6	7	8	9	10	11	12
1	Attitude	6.10	0.048	446	448	459	442	474	396	438	394	383	360	298	327
2	Capacity	6.76	0.049	335	374	355	364	422	438	434	416	415	414	462	436
3	Connector	8.17	0.048	213	185	230	229	270	338	347	410	489	543	668	943
4	Emotion	7.15	0.048	267	319	300	363	404	402	395	437	475	473	514	516
5	Humanity impact	5.84	0.049	536	507	479	482	434	403	364	386	361	310	320	283
6	Intention	7.18	0.047	226	278	321	389	431	398	441	432	447	495	511	496
7	Knowledge	7.20	0.047	250	277	306	352	377	416	438	499	481	487	515	467
8	Personal impact	6.59	0.048	347	382	404	389	413	410	439	435	442	460	386	358
9	Place	6.74	0.049	364	348	381	388	363	400	429	435	466	455	445	391
10	Planet impact	5.30	0.047	613	609	571	529	438	425	370	349	262	265	224	210
11	Responsibility	6.05	0.047	389	456	507	481	434	452	452	369	371	382	317	255
12	Social	4.90	0.048	879	682	552	457	405	387	318	303	273	221	205	183

Table 3: Chi-squared test of the distribution of rankings within each pathway.

#	Pathway	Chi-squared	df	p
1	Attitude	83.635	11	2.91E-13
2	Capacity	41.367	11	2.08E-05
3	Connector	1375.6	11	< 2.2e-16
4	Emotion	182.74	11	< 2.2e-16
5	Humanity Impact	184.81	11	< 2.2e-16
6	Intention	216.1	11	< 2.2e-16
7	Knowledge	227.64	11	< 2.2e-16
8	Personal Impact	32.699	11	0.0005885
9	Place	42.117	11	1.55E-05
10	Planet Impact	603.07	11	< 2.2e-16
11	Responsibility	141.88	11	< 2.2e-16
12	Social	1195.3	11	< 2.2e-16

Table 4: ANOVA multiple regression results^a assessing the relationship between the demographic variables of 1) geographic continent, 2) age, 3) income, 4) education, 5) gender, 6) race, 7) marital status, 8) religion, and 9) politics with the respondents' mean ranks for each of the 12 pathways.

#	Pathway	Continent	Age	Income	Education	Gender	Race	Marital Status	Religion	Politics
1	Attitude	***	**		**	***	***	***	***	*
2	Capacity	***	**		***	***		***	*	
3	Connector	***	**	***	***	***	***	***	***	***
4	Emotion	***	**	**		**		*	**	**
5	Humanity impact	***	**		***		***	***	***	***
6	Intention				*		***	.	***	
7	Knowledge	***		*	***		***	***	***	
8	Personal impact	***		**	***		***	***	***	*
9	Place				**	**			***	***
10	Planet impact	***		***	***	*	***	***	***	***
11	Responsibility			*		*	**	**	**	
12	Social	***	**	***	**	***	***	***	***	***

Significance codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.'

^aSee the Supporting Material for the complete ANOVA output details.

Table 5: Willingness to do conservation behaviors of 4,857 respondents across 13 behaviors.

Behaviors	Not at all (0)	Maybe someday I will do this (1)	I plan to do this (2)	I already do this some of the time (3)	I already do this as often as I can (4)	Weighted Mean ^a
Recycle resources (plastic, paper, etc.)	64	346	945	1551	1951	3.03
Behave responsibly around wildlife	75	327	995	1730	1730	2.97
Reduce my plastic use	103	407	1086	1755	1506	2.86
Pick up trash when I see it on the ground	119	426	937	1939	1436	2.85
Reduce my pesticide and fertilizer use	211	513	1091	1579	1463	2.74
Choose my pets wisely and care for them to reduce wildlife impacts	272	516	1139	1549	1381	2.67
Choose sustainable food options	152	540	1232	1935	998	2.64
Select items to purchase that support saving wildlife and are friendly to the environment	149	585	1317	1952	854	2.57
Seek new information about conservation issues	186	620	1366	1824	861	2.53
Spread the word on conservation to others in my life (in person or online)	267	751	1280	1741	818	2.43
Create habitat in my yard or community	332	930	1358	1465	772	2.29
Donate/volunteer my time to conservation organizations	407	1065	1358	1384	643	2.16
Donate my money to conservation organizations	475	1065	1352	1392	573	2.11

^aThe weighted mean has shifted the scale from 0 to 4 to instead 1 to 5 to eliminate null options.



Table 6: Ordinal regression results presenting the beta coefficients (standard errors) and the statistical significance assessing the influence of the 12 pathways on the likelihood of performing the top three behaviors: recycling, behaving responsibly around wildlife, and reducing plastic use.

	Recycle resources	Behave responsibly around wildlife	Reduce plastic use
Attitude	0.5 (0.08) ***	0.57 (0.08) ***	0.33 (0.08) ***
Capacity	-0.17 (0.08) *	-0.29 (0.09) ***	-0.53 (0.08) ***
Emotion	-	-	-0.17 (0.08) *
Humanity impact	0.51 (0.08) ***	0.48 (0.08) ***	0.16 (0.08) *
Intention	-	-	-0.15 (0.08)
Knowledge	-	-	-
Peripheral	-0.47 (0.08) ***	-0.43 (0.09) ***	-0.38 (0.08) ***
Personal impact	-0.26 (0.08) ***	-0.35 (0.09) ***	-
Place	-0.16 (0.08) *	-0.15 (0.08)	-0.46 (0.08) ***
Planet impact	0.44 (0.08) ***	0.46 (0.08) ***	-
Responsibility	-	0.14 (0.08)	-
Social	0.66 (0.08) ***	0.57 (0.08) ***	0.32 (0.08) ***
Intercepts			
b1	-1.49 (0.91)	-1.47 (1.27)	-5.92 (1.08) ***
b2	0.46 (0.9)	0.30 (1.26)	-4.22 (1.07) ***
b3	1.95 (0.9) *	1.86 (1.26)	-2.75 (1.07) *
b4	3.4 (0.9) ***	3.47 (1.26) **	-1.18 (1.07)
df	12	13	12
Log-likelihood	-6064.23	-6114.68	-6455.83
AIC	12152.47	12255.37	12935.65

Significance codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.'



Appendix F: Example Pathways Survey Scale

Below are a series of statements comparing messages about wildlife conservation. Please read the 4 messages per question carefully, then drag and drop one statement into each of the 4 boxes:

4. The message that MOST matches your perspective and clicks with your identity
3. The message that somewhat matches your perspective
2. The message that somewhat clashes with your perspective
1. The message that LEAST matches your perspective nor clicks with your identity

(Example of survey ranking format shown for Question 1. All other survey questions are simply listed as bullet points.)

Question 1:

	4. MOST matches your perspective (1)	3 (3)	2 (6)	1. LEAST matches your perspective (7)
I am concerned about species extinction. (1)	☐	☐	☐	☐
When thinking about happy memories, they often involve experiences with plants or animals. (2)	☐	☐	☐	☐
A healthy environment impacts my health. (3)	☐	☐	☐	☐
After I've practiced a new skill, I'm motivated to do it the next time I have a chance. (4)	☐	☐	☐	☐

Question 2:

- I listen to what some celebrities say about the environment. (1)
- Animals, plants, and humans are all equally valuable. (2)
- Any community, from rural farmers to urban neighborhoods, can make choices that benefit nature. (3)
- As humanity, we should ensure peace, equality, and justice among us. (4)

Question 3:

- I am willing to do environmentally-friendly things, even if it costs more. (1)
- Having information about environmental problems is enough to make me behave more environmentally friendly. (2)
- Hearing positive nature stories makes me happy. (3)
- I feel a weight of co-responsibility for environmental problems occurring now. (4)

Question 4:

- Parts of the natural world reflect the type of person I am. (1)
- I am motivated to take action to help the environment, however I can. (2)
- Everyone should have access to resources and the opportunity to use them. (3)
- I like to play games and compete with my family or friends. (4)

Question 5:

- I am confident I can take action to help animals. (1)
- I am concerned that roads and cities prevent animals from moving around as they need. (2)
- I tune in to the social media accounts of my favorite actors. (3)
- I choose to help animals when I can. (4)

Question 6:

- I believe we should clean up the environment. (1)
- I am drawn to positive people or stories. (2)
- Helping to address environmental problems will positively impact people around the world. (3)
- I need more information about how I can protect the environment around me. (4)

Question 7:

- I love to play games and try to win. (1)
- I listen to what my family and friends say about the environment. (2)
- I am concerned about the environment. (3)
- I am able to reduce waste and/or recycle. (4)

Question 8:

- I plan on taking action to be more friendly to our planet. (1)
- I get upset when I see animals or their habitat being harmed. (2)
- I feel happy and like myself when I spend time in nature. (3)
- Humans have the right to use the environment to further our progress of humanity. (4)

Question 9:

- I think about how my family and I will be affected by the environment and nature. (1)
- I fact-check information before acting upon it. (2)
- Humans are subject to the laws of nature, and we must fit into the balance of nature. (3)
- I feel parts of my identity are inspired by wildlife. (4)

Question 10:

- I believe our actions have a big effect on the environment around us. (1)
- I am willing make time to do environmentally-friendly things, even if it takes longer. (2)
- I try to be like those I admire. (3)
- I can feel overwhelmed by negative topics like pollution or climate change. (4)

Question 11:

- Humans are abusing the environment. (1)
- Nature has shaped parts of who I am. (2)
- I feel responsible for some environmental issues that exist today. (3)
- I think about how environmental problems will impact the activities my family or I can do. (4)

Question 12:

- I am personally able to make a difference in saving wildlife. (1)
- I like to have all of the information about something before I take action on it. (2)
- Humans need to care for one another, across all differences like nationality, religion, sex, etc. (3)
- I like to do things with people who are important to me. (4)

Question 13:

- I want to learn more about how to protect nature. (1)
- I often think about animals. (2)
- Landowners should work together to address environmental problems. (3)
- Humans must protect the planet. (4)

Question 14:

- I could explain which actions are harmful and which are helpful to nature. (1)
- I don't want poor environmental conditions to hurt my community. (2)
- I can commit to taking Earth-friendly actions in my daily life. (3)
- I seek to have an environmentally friendly lifestyle at home. (4)

Question 15:

- I have an emotional pull towards special places in nature or the outdoors. (1)
- I would switch to using sustainable lightbulbs to help save me money. (2)
- When others are experiencing emotions, sometimes it feels like I'm experiencing those emotions too. (3)
- If an expert tells me it is urgent to do something, I'll trust and feel motivated to take action. (4)

Question 16:

- Plants and animals have as much right as humans to exist. (1)
- Even if I don't like a fact, if the source is verified and reputable, I will accept it. (2)
- If someone I trust tells me about an environmental problem, I want to help them fix it. (3)
- I think about environmental problems. (4)

APPENDIX F: EXAMPLE PATHWAYS SURVEY SCALE

Question 17:

- If it makes my community healthier, I would do more environmentally friendly actions. (1)
- I try to avoid others who speak negatively without addressing any solutions. (2)
- People and businesses can work together to reduce waste. (3)
- I wouldn't be who I am today without nature. (4)

Question 18:

- If people are able to acquire property, they can enjoy it how they want. (1)
- I intend to make choices that help save wildlife. (2)
- I sometimes contribute to our overuse of resources like water, gas, land, or electricity. (3)
- I understand why choices like recycling, conserving water, or reducing plastic help the environment. (4)

Question 19:

- In general, being part of the natural world is an important part of my self-image. (1)
- If I had more knowledge about how to do it, I could help save the environment. (2)
- I think the use of fossil fuels (i.e., coal, crude oil, natural gas) is a problem. (3)
- My friends or loved ones care about the planet. (4)

Question 20:

- I think about how plants or animals are affected by the environment. (1)
- I think about how people around the world are affected by the environment and nature. (2)
- If it helps secure a good future for me, I will use less energy. (3)
- If there's a positive story about saving wildlife, I like to follow it and see the happy ending. (4)

Question 21:

- One or more of my fondest memories takes place somewhere in nature. (1)
- I've been taught how to help the environment. (2)
- Social media is my favorite source of information. (3)
- I plan to continue behaving in an environmentally-friendly way. (4)

Question 22:

- I often think about nature. (1)
- I would like to do more to protect nature. (2)
- Most people whose opinions I value think I should make environmentally-friendly decisions. (3)
- My actions make a difference in the environment. (4)

Question 23:

- If it makes me healthier, I would do more environmentally friendly actions. (1)
- It's important to me to have nature in my life. (2)
- When someone I trust asks me to do something, I try to do it. (3)
- People need to care for one another by ensuring everyone has a healthy environment. (4)

Question 24:

- I'm sad when others are sad. (1)
- If it makes local wildlife healthier, I would do more environmentally friendly actions. (2)
- People in my social circle are concerned about issues relating to the environment. (3)
- If the facts prove otherwise, I'll change my opinion about something. (4)

Question 25:

- Things that I do have an impact on nature. (1)
- There's an outdoor location that holds a special place in my heart. (2)
- People should clean up the environment to help all species live. (3)
- I believe we should protect wildlife. (4)

Question 26:

- The earth has plenty of natural resources for humanity to thrive. (1)
- Spending time in nature makes my day better. (2)
- When thinking about activities I like to do, it usually involves the outdoors. (3)
- When given the choice, I choose to support environmentally friendly businesses. (4)

Question 27:

- My plan is to behave environmentally-friendly as often as I can. (1)
- When I see images of environmental destruction, I quickly try to shift my focus to something less upsetting. (2)
- When something is verified by multiple experts, I accept it even if I have to change my beliefs or behavior. (3)
- To stay up to date with environmental news, I check social media regularly. (4)

Conservation Behavior and Demographic Questions**Question 28:**

Below are some activities that may help to save wildlife. To what extent would you consider doing or are already do the following?

- Reduce my plastic use (1)
- Recycle resources (plastic, paper, etc.) (2)
- Pick up trash when I see it on the ground (3)
- Spread the word on conservation to others in my life (in person or online) (4)
- Create habitat in my yard or community (5)
- Seek new information about conservation issues (6)
- Select items to purchase that support saving wildlife and are friendly to the environment (7)
- Choose my pets wisely and care for them to reduce wildlife impacts (8)
- Donate my money to conservation organizations (9)
- Donate/volunteer my time to conservation organizations (11)
- Reduce my pesticide and fertilizer use (10)
- Behave responsibly around wildlife (12)
- Choose sustainable food options (13)

Question 29:

Are there any barriers currently preventing you from taking conservation actions? Choose all that apply:

- I need to know more about conservation actions (1)
- I need more understanding about why they're important (2)
- I need more understanding about the impact my own actions make (3)
- I need more interest in the topic (4)
- I need more time (16)
- I need more opportunities to try out conservation actions (5)
- I need more trainings/practice on the conservation actions (6)
- I need more opportunities to hang out with other people interested in conservation (7)
- I need more support from friends/family (9)
- I need more support from my leaders and/or team at work (8)
- I need more incentives (e.g., recognition, rewards, swag) (10)
- I need more visible results from my conservation actions (11)
- I need more knowledge about the benefits of conservation actions over my current actions (12)
- I need more understanding about how conservation actions are compatible with my lifestyle (13)
- I need clearer and simplified conservation actions (14)
- Nothing - I'm doing everything I can (15)

Question 30:

In which country do you currently reside?

Question 31:

In which state do you currently reside? (If List of Countries = United States of America)

Question 32:

What year were you born?

Question 33:

What was your total household income in 2019?

- \$25k or less (1)
- \$25,001 to \$35k (2)
- \$35,001 to \$50k (3)
- \$50,001 to \$75k (4)
- \$75,001 to \$100k (5)
- \$100,001 to \$150k (6)
- \$150,000 to \$250k (7)
- More than \$250k (8)
- Prefer not to answer (9)

Question 34:

What is your highest level of education? (Please select one)

- Less than a high school diploma (1)
- High school diploma or GED (2)
- Some college or 2 year degree (3)
- Bachelor's degree (e.g., BA, BS) (4)
- Master's degree (e.g., MA, MS) (5)
- Professional degree (e.g., Law, MD, DVM) (6)
- Doctorate (e.g., PhD, EdD) (7)

Question 35:

What is your gender?

- Male (1)
- Female (2)
- Other (5)
- Prefer not to answer (4)

Question 36:

What is your race or ethnicity? Check all that apply.

- White (1)
- Black or African (2)
- Native or Indigenous (3)
- Asian (4)
- Native Hawaiian or Pacific Islander (5)
- Hispanic or Latino (6)
- Prefer not to answer (7)

Question 37:

What is your marital status?

- Single (never married) (1)
- Married (2)
- In a domestic partnership (3)
- Divorced (4)
- Widowed (5)

Question 38:

What is your religion?

- I'm not religious (9)
- Christianity (2)
- Judaism (3)
- Islam (4)
- Buddhism (5)
- Hinduism (6)
- Other (7)
- Prefer not to say (8)

Question 39:

How would you describe your political view?

- Very liberal (1)
- Slightly liberal (2)
- Moderate (3)
- Slightly conservative (4)
- Very conservative (5)
- Prefer not to say (6)

RECOMMENDED ENGAGEMENT PROGRAM DESIGN AND EVALUATION RESOURCES

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www.conservationstandards.org

Jacobson, S.K., M. McDuff, and M. Monroe. (2015). Conservation Education and Outreach Techniques, 2nd Edition. Oxford, UK: Oxford University Press. 428 pp.

North American Association for Environmental Education, Evaluating your environmental education programs: A workbook for practitioners:
www.naaee.org

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Salazar, G., Kunkle, K., & Monroe, M. (2020). Practitioner guide to assessing connection to nature. NAAEE (North American Association for Environmental Education): Washington, DC, USA.
<https://naaee.org/sites/default/files/2022-10/Assessing%20Connection%20to%20Nature.5.6.20.pdf>

PRISM Toolkit for Evaluating Outcomes and Impacts (2017): <https://www.conservationstandards.org/wp-content/uploads/2020/10/PRISM-Evaluation-Toolkit-V1-3.pdf>

MEERA, My Environmental Education Resource Assistant:
www.meera.snre.umich.edu

Informal Science: www.informalscience.org

Conservation Education Committee newsletters, Association of Zoos and Aquariums (AZA) Seattle Aquarium. Best Practices in Developing Empathy toward Wildlife.
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