

**Podcasting to Empower People**

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Sustainability and Resilience Podcast

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### **Executive Summary**

Everybody stands in the detergent aisle struggling to choose the right eco-friendly detergents and debates at grocery store whether local or organic is more important. Consumers daily choices have become much more complex from recent changes in the scale of human development. The increase in complexity impacts the multifaceted, adaptive, and, at times, vexing systems of our world. When an individual person or organization asks, ‘what is the sustainable choice?’, the answer depends on a multitude of variables, materiality of issues and ingrained systems boundaries.

The commonly accepted goal of sustainability, to fulfill our current needs and maintain the world's systems so future generations can also fulfill their needs, unifies efforts efficiently and aligns people with future thinking. But the concepts related, and their applications are fairly ambiguous in guiding people to what exactly they can do to make choices for sustainability. Learning about your impact on these variables, and the system they create, provides opportunities to continuously improve on our choices towards sustainability.

Sustainability and Resilience is an optimistic podcast that journeys through thought-provoking science-based sustainability challenges with a bit of comedic relief, to entertain and empower listeners to know what sustainable choices are, and why they are sustainable. The podcast uses systems thinking to provide listeners with a holistic understanding of the challenge at hand, as well as how their actions can make a difference as part of these systems. Bridging science and entertainment, while empowering listeners to change the world through everyday choices, the podcast aims to drive momentum towards societal shifts. Cumulative actions of aware minds can change the world on a large scale.

### Abstract

Our choices make a difference and can add up to societal shifts that change the world for the better. In such a complex world, there is a clear need for guidance through these systems. S&R podcast uses systems thinking to pinpoint, realistic actionable items and empower listeners with a broad-spectrum sustainability knowledge for making everyday choices. In sharing our vision, the podcast asks people to ‘listen today for a more sustainable future’. Foundational research proved, developed and formed the idea of the podcast. Recording research lead to the ability to record test episodes, gather listener feedback and update the podcast concept. The podcast was officially created with the release of the debut episode. Anyone can listen today to learn about how people are responding to this edible sustainability challenge.

*Keywords:* sustainable choices, systems thinking, podcasting, societal shifts, empowerment, futurism, optimism

## Podcasting to Empower People

### **Sustainability**

Sustainability is a complex and variable topic. Conventionally, it is a triple-bottom-line approach that considers and accounts for economic, societal and environmental impacts. Traditionally, sustainability is defined as “development that seeks to meet the needs and aspirations of the present without compromising the ability to meet those of the future” (United Nations, 1987, p. 34). Culturally, sustainability is about futurism (Basiago, 2006). Thinking about the next generations and the world they will inherit (University of California Los Angeles, n.d.). More scientifically, sustainability is the use of long-term, systems thinking to achieve a dynamic equilibrium between resource consumption or byproduct creation and the rates of resource regeneration or absorption for the whole planet, its biospheres, and humanity (Ben-Eli, 2018). The variety of conventional, traditional, cultural and scientific definitions have developed and unified sustainability efforts overtime. Green efforts are aligned by the commonly accepted goal of thinking about the future, and humanities impact on the world. However, the interpretations of sustainability, and the application of it is fairly ambiguous about exactly what people can do to make choices for sustainability.

### **Systems Thinking for Sustainability**

According to Systems Engineer Michael Ben-Eli, sustainability challenges are all part of an “exceedingly complex, dynamic, multivariable universe” (Ben-Eli, 2018, p. 1338). They can involve economic, political, social and cultural aspects of human-based systems and all interact with the natural non-human systems of the world. Undergoing such “explosive change and unprecedented growth” (Ceres, 2010, p. 6), has led to sustainability drivers such as competition for resources (Ben-Eli, 2018), environmental degradation, equitable economic globalization, and social justice (Metzger, Putt del Pino, Prowitt, Goodward, & Perera, 2012). Acting to change sustainability challenges within in these systems can be understandingly overwhelming and at times, confusing as they do not have linear or simple answers (Ben-Eli, 2018). However, in publications such as The 21<sup>st</sup> Century Corporation: Ceres Roadmap for Sustainability, many leaders around the world have commended businesses and consumers for making sustainable choices (Ceres, 2010). Nike CEO Mark Parker integrated sustainability because “it is essential for success in a world of constrained resources” (Ceres, 2010, p. 5). The need for more sustainable choices is clear.

### **Choices for Sustainability**

Jane Goodall has explained for decades that people “cannot get through a single day without having an impact on the world around them. What [people] do makes a difference, and [they] have to decide what kind of difference [they] want to make.” (Erdős, 1970). Inspired during her research as a primatologist from the realization of the interconnectedness between everything in the world, Dr. Goodall has since become a global leader in environmental conservation and an emissary of sustainability. Chimpanzees threatened by systematic deforestation motivated her to tackle the root causes of deforestation, leading to the effective preservation of chimpanzee habitat. From deforestation to climate change, throughout her career she has campaigned for sustainability by educating consumers, producers and policy makers about the power, and consequences of the choices they make every day.

Dr. Goodall’s studies in biology led her to become a conservationist. As a conservationist, she realized that addressing the sustainability challenge of deforestation, she needed to address all of the system drivers impacting deforestation. She changed the world by advocating for conservation, and maybe even more importantly, by encouraging others to focus on thinking in systems. Consumers daily choices have become much more complex from recent changes in the scale of human development. In a recent interview David Gelles asked Dr. Goodall what message she wanted to share with decision makers of the world (2019). Among other important messages, she encourages consumers to shop consciously for sustainability, asking questions about products such as:

What do you buy? Where did it come from? Where was it made? Did it harm the environment? Did it lead to cruelty to animals? Was it cheap because of child slave labor? And it may cost you a little bit more to buy organic food, but if you pay a little bit more, you waste less... Eat less meat? Or no meat? (Gelles, 2019).

When an individual or organization asks, ‘what is the sustainable choice?’, the answer depends on a multitude of variables, materiality of concerns and ingrained systems. It’s essential for people to be aware of and knowledgeable about how they fit into the larger, complex and adaptive systems they are making choices in, because understanding will allow them to continuously improve choices towards sustainability (Metcalf & Benn, 2012). After learning about the various cause and effect relationships that impact and drive the sustainability

challenges at hand, people can integrate those concepts into their own choices, lives, organizations and policies.

### **Cumulative Small Changes for Societal Shifts**

Individuals making changes in their everyday lives can add up to substantial and far-reaching societal shifts. To successfully influence or change mainstream education, policy, and culture, a change idea must first engage with people directly (Henderson, 2015). Individuals learning, relating and engaging with these concepts become empowered to change the world through their actions and everyday lives. Sustainable changes are driven by continuous small steps, focusing on continuous progress, not perfection (Werbach, 2009). Once a person believes that their choices make a difference, they tend to take more purposeful actions. A small step such as changing a lightbulb can lead to further, compounding sustainable actions (Werbach, 2009). There is a need for an engaging and knowledgeable educational service about sustainability, reaching society at large and empowering people to create a more sustainable world.

### **Podcasting for Sustainability**

#### **Podcast Idea Cultivation**

The podcast creator and host, Kate Cheney is a humanist that believes in the power of preserving dignity through conflict resolution and the need for collaboration to solve our wicked problems. Her journey to becoming a sustainability scientist started in her junior year of college when she interned as a Sustainability Energy Auditor. She quickly became interested with the process of helping others adapt and become more resilient. Kate knew she wanted to help empower others so they could be confident in their ability to make sustainable choices. Podcasting can help a person share their unique message and make an impact in people's lives (Podcast Paradise, 2020). With her personal love of listening to podcasts, Kate decided that she wanted to make the world more sustainable with a podcast.

According to The Podcast Journal (Dumas, 2018), the first step to creating a podcast is to narrow the topic to a unique niche based on what the podcast creators' passions and life experiences are. She developed a podcast to join her two passions of sustainability sciences and comedic entertainment. Kate also wanted to include resilience and optimism as podcast characteristics and topics. Through learning about the sustainability sciences, Kate found that although the sustainability failures of the past were worth learning about, they were not worth focusing on. Instead Kate wanted to focus on what was standing out in these challenges as

beacons of hope and acts of innovation for resilience. After much introspection and journaling, the concept for the podcast formed to become ‘optimism and adapting to a new world’

### **Project Overview**

Bridging science and entertainment, the podcast aims to drive momentum towards societal shifts where the cumulative actions of aware minds can change the world on a large scale. Sustainability and Resilience (S&R) is an optimistic podcast that journeys through thought-provoking science-based sustainability challenges with a bit of comedic relief, to entertain and empower listeners to know what sustainable choices are, and why they are sustainable. Sustainability specialist and podcast host, Kate Cheney, is accompanied by co-host Brian Perkins, a sustainability and systems engineer.

Conversations between hosts are science-based with light comedy intermixed, involving listeners in sustainability learning as a way to inform their thoughts and actions. The podcast uses systems thinking to provide listeners with a holistic understanding of the challenge at hand and empowers listeners to change the world through the impact of everyday actions and choices. Listeners receive free monthly releases of episodes on multiple podcast platforms such as iTunes podcast, Stitcher, Google Play and Spotify.

### **Foundational Research**

This podcast began as a rather blank slate. The initial idea of a podcast about optimism for adapting to a new world developed further details through foundational research. In this research phase, a feasibility study and sSWOT analysis were completed. Then the team began research about the audience, conducted stakeholder engagement and formed a more complete idea of the goals and objectives of the podcast. To complete the foundational research, a Work Breakdown structure and Gantt chart provided the team with the project management tools they needed to start the project with confidence in success.

**Feasibility Study.** Conducting a feasibility study tested the initial concept and examined the market for opportunities. It covered research into the audiences for podcasts and identified influences from other podcasts, the value to podcast hosts and audience members, the podcast idea market niche, and lastly the financing options available. This study showed that with an expansive audience, this sustainability podcast idea was a feasible, value-creating project. It also showed what other podcasts are doing well, what they could improve on, and where there is a market niche.

***Audience.*** Podcasts are becoming very popular nationally and globally. Forty percent of Americans listen to 45-60 minutes of podcasts every day (Baer, 2019) and globally, 30% of all people listen to a podcast at least monthly (Winn, 2019). Studies show that people who listen to podcasts do so because they are seeking to expand their knowledge about topics with content that they cannot elsewhere and enjoy the relationship with the host(s) (Backyard Media, 2018).

***Other Podcasts.*** As an avid podcast listener herself, Kate studied the successes and potential areas of improvement of other podcasts. Her personal favorites and other popular podcasts all had great quality, steady dependable releases, and episodes spanning from fifteen minutes to an hour or longer. A source of inspiration, Planet Innovation is a sustainability podcast created by a professor that discusses business solutions to environmental problems.

Standing out from other sustainability podcasts available today, Planet Innovation focus on the solutions to the problems faced today, instead of the problems we have already been talking about. They interview scientists and inventors as they cover innovative topics. Creator Magali Delmas, said “environmentally-based podcasts often focus on the problems and tend to inform people that they should change something, but often don’t give concrete fixes” (University Wire, 2018).

***Value.*** Podcasting allows the creators reach a global audience gain credibility in their field, and connect with listeners (Podcast Paradise, 2020). Being a sustainability podcaster would allow the hosts to grow their professional credentials. For S&R podcast this could result in the hosts building careers as a sustainable entrepreneur, writing books, recording audiobooks, creating other media content, and consulting for sustainability. All of which create value for the hosts, as well as content for supporters. Podcast listeners will receive free, high quality entertainment that is convenient to listen to and tailored to what they are interested in learning. The largest value to listeners is easily understanding what sustainable choices are, and most importantly, why.

***Market Niche.*** Discussing sustainability topics such as biodiversity loss, severe storms, disease and pollution can be very daunting topics. By optimistically bringing attention to what is working, the podcast can help keep people focused on seeing challenges as opportunities (Scott & Esteves, 2013) and attract new listeners that may otherwise be turned off to sustainability (Peter & Honea, 2012). Optimism is a universal and tends to be remaining positive about the



future (Gallagher, Lopez & Pressman, 2013). Podcasting using optimism is an opportunity to create a market niche that makes S&R podcast unique and adds value.

**Financing Options.** Podcasts are able to financially sustain their production teams through sponsorships and patron donations. Although the podcast is available to anyone with internet access for free, podcasters with mission and value driven podcasts receive financial support from audience members that share those values. After minimum download thresholds are met, the podcast project team can reach out to advertisers for funding to help mitigate start-up costs and create profitability as the show develops. According to a cost-per-impression model, this show could receive \$40 per 1,000 downloads for each episode (Patel, 2016). But with an undeveloped listener base, it can expect to have 200 downloads per episode in the beginning (Harmer, 2018). Also, to help with crowdfunding a page can be created on Patreon, that typically yields an average of \$7.00 per supporter (Patel, 2016) and is potentially a large part of the long-term funding for the show.

**sSWOT Analysis.** Covering strengths, weaknesses, opportunities, and threats of a project or organization, sustainability SWOT analysis is similar to a traditional SWOT analysis, however, differs in examining global trends and current socio-environmental challenges. Big trends experienced around the world today include demographic shifts, globalized economy, political pressures, and technological advancements (Metzger, et al., 2012). Socio-environmental challenges could include reducing pollution, natural resource preservation, preparing for climate irregularity, and restoring ecosystem services. The sSWOT can identify sustainability impacts for both an entity and externalities, as well as grow awareness of and drive progress towards sustainable opportunities (Metzger, et al., 2012).

For the S&R podcast, it is important to be aware of the right to internet access, infrastructure for internet access, smart devices, mobile networks, the digital divide, etc. After exploring trends and challenges from a global perspective the strengths, weaknesses, opportunities, and threats can be identified and accordingly prioritized based on materiality. This analysis was constantly referred to as tool for decision making during the project and was updated as needed throughout.

**Strengths.** Many strengths were observed for podcasting in general and specifically a sustainability podcast. Reaching a broad audience that listens for free using just a phone or computer podcasts can change the world using education and empowerment. Podcasts have very

low costs of production and environmental footprints, as well as a high operational and financial stability. This is possible as most podcasts are produced remotely, with little resources needed. Using electricity, cloud computing, internet and mobile infrastructure that is already in-place and shared by society lowers the carbon, waste, and ecological footprint. Hosts can choose from a wide variety of topics, creating their own ‘works-of-art’ that add to their credibility as multidimensional sustainability professionals. Podcasters become better communicators and better explain cause and effect relationships (Patel, 2016), which builds skills for writing books and recording audiobooks in the future.

Along with communication practice, podcasts provide the podcast teams with networking opportunities through collaborating with guests, partnering organizations and more. Overtime, long-term relationships with listeners can add to a host’s influence level. Podcasts are also rather well-planned communication that provide clear messages to listeners. Podcasts can continue indefinitely and eventually, can become profitable. Long-term plans could develop a podcast network or collection of sustainability podcasts, and collaborations with other sustainability-minded companies for content and advertisement slot sponsorship. Although S&R podcast has many strengths, there are also weaknesses to be aware of.

***Weaknesses.*** As a sustainability podcast talking about sad topics brings people down and creates anxiety. This might turn listeners off to the show if we do not communicate optimism clearly and often. Also, controversial and political topics, as sustainability topics often are, turn off listeners. The podcast may not grab people’s attention enough or perhaps people may not care enough to listen. In the short-term, podcasts are not very profitable. As the podcast itself is a one-way communication, there is not enough engaging two-way communication for people to care about the podcast mission. Learning curves are steep for web and graphic design, as well as increasing capacity for recording and editing. The success of the podcast also relies on reaching people through devices that are typically found in wealthier homes. The digital divide is narrowing, but people around the world do not all have access to internet, or the devices needed to listen. However, with the use of mobile devices now commonplace around the world (Poushter, 2017), podcasts have many opportunities to reach people through these devices.

***Opportunities.*** Podcasts are growing in popularity and are a highly engaging and intimate form of communication. People listen to podcasts, so they can learn about new topics and improve their base of knowledge. This podcast provides an area to showcase sustainability

concepts applied to real-world topics, case studies and innovative initiatives. Revenue growth can be achieved through support from listeners and sponsorships from the private market. The podcast can also grow revenue from taking advantage of the sustainability niche. Podcasts can share useful, realistic, accurate, reliable, credible and salient information. The publishing of the ‘Sustaina-blog’ on sustainabilitypod.com ensures transparency of resources and acts as a knowledge repository. The listener write-in program increases two-way communication and collaboration, and creates a sense community for the listeners.

**Threats.** It can be difficult to incorporate effective sustainability information, as resilience efforts to sustainability challenges have historically been add hock and not scientific. Podcasts are known to be easy to start, but hard to keep going. Coordinating podcasts, blogs and social media posts is difficult. New episodes are hard to keep releasing on a regular basis and could lead to illegitimacy if there is enough infrequent action. If research is not fact checked, inaccurate information will lead to corrections and possible online harassment. There is no way to know an exact number of listeners for any podcast, instead the listener base is defined for most podcast rating systems as number of downloads per episode and number of subscriptions to the show over time. Non-English speakers and people who are deaf cannot fully enjoy. If there is no internet or power, podcast has to shut down. Listeners were the most important stakeholder group for the podcast to be successful. It is crucial to understand and empathize with their values, pains and gains in order to create a well-communicated change idea.

**Audience Research.** After identifying that there was an audience for a sustainability podcast, further audience research as conducted to examine the best way to approach the listeners. Listeners are the most important stakeholder group for the podcast to be successful. It was crucial to understand and empathize with their values, pains and gains in order to create a well-communicated change idea (NMI, 2013). Understanding others is an important part of communicating. S&R podcast first needed to understand what the listeners were feeling when they listened to the podcast so that the podcast could communicate more effectively.

**People and Change.** Shock, denial, anger and resistance are all expected and are natural phases people go through after hearing their world has changed or is changing (University of Exeter, n.d.). Much like the stages of grief, anger is soon met with sadness and internal feelings of despair. As people move to the next stage, they start to feel less gloom through exploration. Exploring new ideas and potential adaptations then makes people feel hopefulness for the future.

People who feel hopefulness for the future find joy in making commitments to change. Sustainability issues, like climate change, send many people into despair. This was strategically noted as an opportunity for the podcast to inspire hope for commitment to the future.

Unfreezing the status quo is needed before change can take place. To do this, the podcast used Lewin's model to first establish a sense of urgency, then form a powerful coalition, and create a vision. Then, to initiate change, communicate the vision, empower others to act on the vision, and create short-term wins (Hussain, et al., 2018). Communicating the change vision is the most important aspect of seeking changes in others (Kotter, 1996, 2011). The shared vision being communicated unites people towards a common goal and provides an anchor for people to hold on to throughout the phases of change. A vision for the future should provide a clear action to take for the ideal future (Kotter, 1996). The simple vision for S&R podcast formed through research to become 'Listen today, for a more sustainable future!'

***Stakeholder Engagement.*** The podcast success is dependent on reaching the hearts and minds of listeners. This makes the audience of current and potential listeners the main stakeholder group. The strategy for the stakeholder engagement was developed using BSR's Five-Step Approach (Taylor, Bancilhon, Oger, & Morris, n.d.). The first step starts with setting a vision or goal for what is needed from the upcoming stakeholder engagements. Step two maps stakeholders, leading to step three where the preparation for engagement is done. The actual engagement occurs as step four. After engagement, step five involves taking the feedback from stakeholder engagement and identifies how that information can be acted on or follow-ed up with.

***Communication Plan.*** When first identifying stakeholders and stakeholder mapping took place that selected engagement methods and actors to prioritize, a Communication Plan found in Appendix B was created to address each audience segment and the communication objectives for each. Preparing to engage the audience, this plan set the podcast vision, communication objectives and details of 'messages' to be communicated.. Stakeholder groups included listeners, supporters, sponsors and the podcast production team.

Conducting the stakeholder engagement took the form of podcast social media posts, the alpha, beta and pilot episodes themselves, the test-group listener feedback, and internally among the production team. From all stakeholder engagements and feedback, whether formal or informal, the Communication Plan and podcast goals were updated. As listeners are the most

material stakeholders, listener feedback proved to have troves of opportunities for continuous improvement.

***Testing and Feedback.*** To get the podcast to launch, stakeholder feedback along the way was crucial for improvement of the podcast so that became high quality entertainment that people could connect with. The podcast project team updated the podcast with feedback that can be found in Appendix C by holding periodical team meetings each episode, reviewing feedback and incorporated it into the next episode. Feedback led to increases in the production quality, the ability to reach our listeners more effectively, and helped to provide more of a value to our target audience. Although the podcast changed shape throughout the process of stakeholder engagement, the overall structure of creating the core of the podcast stayed the same. The structure of researching a specific topic, writing a script, recording the conversation between hosts, editing the content, and lastly marketing the release are all integral phases to producing each episode.

### **Work Breakdown Structure**

Starting with the goal of creating the podcast from the ground up and achieving the completion of alpha test, beta test and pilot episodes, the Work Breakdown Structure organized all the tasks and stakeholders involved. This was the first project management tool used to gather all the tasks needed to complete the goals and explore time management, budget, stakeholders, risks and resources involved with each task. Here, the need for technical assistance became noticed and the team grew to include a producer and a technical advisor. This document was very useful during early project planning and laid the groundwork for a Gantt chart to coordinate the entire podcast creation from start to finish.

### **Gantt Chart**

After spending a month conducting foundational research, all the project tasks, milestones and goals were identified, providing the information needed to build a Gantt chart. The creation of this chart then allowed the podcast to organize, schedule and coordinate with different team members and stakeholder groups. This tool helped to ensure all of the further foundational research was included in the planning process and gave the team a visual schedule to quickly look at task timing and workflow. Researching, writing, recording, editing and marketing the test episodes. were included. Release of the pilot episode was the milestone that



### **Recording Research**

Reading and following a guidebook for creating a podcast, such as ‘From Idea to Podcast in 50 Days’ assisted in researching and scheduling tasks. The research about recording included finding a location to record, purchasing, microphones, sound booth material to insulate echo and editing software, then learning how to use the equipment and software to record. After the equipment was set up, testing took place for several weeks before the hosts found the tone, cadence and sound quality that they were aspiring for. Audio testing consisted of the hosts reading news articles and playing it back, then making adjustments to improve on a few aspects of the recording at a time.

### **Marketing and Test-Episodes Feedback Response**

During the early recording research, the theme music played at the beginning of each episode was written and performed by the host on an ukulele. The marketing basics started with designing a logo and infographics. The logo and examples of the infographics can be found in Appendix E. The marketing phase also included creating a website (Sustainability and Resilience, 2020e), a blog (Sustainability and Resilience, 2020e), Patreon page (Sustainability and Resilience, 2020c), listener-write in program, Facebook page (Sustainability and Resilience, 2020b), and Instagram page (Sustainability and Resilience, 2020). To start accepting sponsorship payments from the patron listeners, the Patreon page was created with three tiers with unique benefits; Supporter, Change-maker, and Sustainability Investor. All tiers will receive a logo podcast sticker for their support and the supporters in the highest tier, Sustainability Investor will have their names announced at the end of the show as a sign of gratitude.

For the listener write-in program, listeners can write emails to sustainabilitypod-@gmail.com to share their responses to sustainability discussion questions posed by the hosts at the end of the episode such as, ‘what do you consider sustainable seafood?’. Hosts then record mini-episodes between regularly scheduled full length episodes that share the listener write-in mail and any light, brief and optimistic sustainability-related news. This program creates a sense of community among listeners, engages hosts and listeners in effective two-way communication, celebrates sustainability efforts, and provides a platform to facilitate world-wide collaboration for sustainable changes.

### **Pilot Episode**

With the release of the pilot episode on all major platforms, advertisements were bought on Facebook and Instagram, resulting in increased traffic to the website and a large spike in downloads. These boosted posts are in Appendix F. According to RSS feed host Podbean and information found in Appendix G, the total number of downloads was almost 70 and the episode reached listeners around the world, however they were mostly in the United States. Complete audience metrics are available for the podcast through the hosting service that provides the RSS feed, as all platforms that listeners use are connected to that feed. To be accepted to the various platforms such as iTunes and Spotify, the podcast pilot episode and graphics had to be approved by each platform. After being accepted, listeners can now find our show by searching our name or by browsing category science, subcategory comedy.

### **Sustaining the Podcast with Systems Thinking**

After the release of the first episode, the podcast team consolidated the process for episode creation into a monthly Gantt chart and schedule, found in Appendix D. In addition to a structure for repeatedly scheduling the creation of episodes for monthly releases, the team used stakeholder feedback to create structures for both selecting and developing each episode's content. Given the complexities of the global systems at hand with episode topics, feedback drove the team to realize the need for more critical awareness of challenges. This meant using a systems thinking approach “so that different viewpoints... can be surfaced” and “a diversity of approaches, possibly from different paradigms” (Smith, 2011, p. 5). First, the team created a structure for selecting topics, then created a framework for developing content.

### **Structure for Selecting Topics**

The team wanted to do the great Pacific garbage patch as a topic for the second episode. However, they felt it was too large of a topic to tackle so they created a structure for selecting topics that fit the podcast's constraints. The first step is Select prospective topic from current events or a pre-made bank of sustainability challenges. Then identify social, environmental, economic impacts that are outcomes or drivers of the challenge, as well as any potential areas of resilience. When the topic is fairly well understood, the team then creates an initial systems diagram where they set the boundaries in accordance an approximately 45-minute-long episode. The problem definition of the challenge can then be well defined within the given system boundaries and content can be developed further.



### **Framework for Developing Episode Content**

To guide and streamline the research and writing processes, the team created a framework for developing episode content. Researching variables with a global, sustainability lens is the first step. Then, the causal loop from the initial diagram can be updated with more in-depth research. Using the systems diagram and examining cause and effect relationships, the team then pinpoints leverage points for realistic actionable items that can influence the drivers of the challenge. Another important aspect of the framework comes next, as they identify the past, present and ideal future states. This helps with explaining the history to listeners as well as influencing what the leverage points are for sustainable choices. Lastly, when identifying ideal future states, the team constantly brainstorms discussion questions to ask listeners at the end of the episode.

After creating the frameworks for topic selection and episode development, the podcast team is now them for the second episode. As an experiment in progress, and to use research already conducted, the team has chosen Chesapeake Bay Oysters as the topic for the second episode. This is the same topic of the Alpha and Beta test episodes and with additional research based on systems thinking, the team is going to rewrite the episode using what they have learned. Pictures and diagrams in Appendix K show how the podcast team has improved the systems diagram. Scripts covering the evolution of production can also be found in Appendices H through J. These create a clear ‘before’ systems thinking and ‘after’ examples to show how useful this approach is to sustainability challenges. Using what was learned and releasing the second episode, Sustainability and Resilience podcast is continues to create changes for the future, one listener and topic at a time.

### **Conclusion**

Sustainability is complex and adaptive, making it ambiguous what sustainable choices actually are. Our choices make a difference and can add up to societal shifts that change the world for the better. In such a complex world, there is a clear need for guidance through these systems. S&R podcast uses systems thinking to pinpoint, realistic actionable items and empower listeners with a broad-spectrum sustainability knowledge for making everyday choices. In sharing our vision, the podcast asks people to ‘listen today for a more sustainable future’.

The podcast host knew she wanted to start a podcast to empower others to know what sustainable choices are, why. Needing to start somewhere, she identify what she had passions for

and experience doing. Soon she emerged with the concept of ‘an optimistic sustainability podcast’. Foundational research proved the case for, developed and formed the idea of the podcast. This research included a feasibility study, sSWOT analysis and audience engagement. Recording research lead to the ability to record test episodes, gather listener feedback and update the podcast concept. The podcast was officially created with the release of the debut episode. Anyone can listen today to learn about how people are responding to this edible sustainability challenge. Together with listeners, S&R podcast is committed to continuously improving efforts to address the drivers of sustainability challenges.

## Reference

- Backyard Media. (2018, February 28). Why People Listen to Podcasts Instead of Consuming Other Digital Media. Retrieved from <https://backyardmedia.us/blog/2018/2/10/why-people-listen-to-podcasts>
- Baer, J. (2019). New Demographic Research Shows Who Really Listens to Podcasts. Retrieved from <https://www.convinceandconvert.com/podcast-research/new-demographic-research-shows-who-really-listens-to-podcasts/>
- Basiago, A. (2006, December 7). Methods of defining 'sustainability'. Retrieved from <https://onlinelibrary.wiley.com/doi/abs/10.1002/sd.3460030302>
- Ben-Eli, M. (2018). Sustainability: Definition and five core principles, a systems perspective. *Sustainability Science*, 13(5), 1337-1343.
- Ceres. (2010). The 21st Century Corporation: The Ceres Roadmap for Sustainability. Retrieved from <https://shift.tools/resources/759>
- Dumas. (2018). The Podcast Journal - from idea to Podcast Launch in 50 Days.
- Erdős, L. (1970, January 1). Jane Goodall – A Lifelong Optimist. Retrieved from [https://link.springer.com/chapter/10.1007/978-3-030-31806-2\\_23](https://link.springer.com/chapter/10.1007/978-3-030-31806-2_23)
- Gallagher, M., Lopez, S., & Pressman, S. (2013). Optimism Is Universal: Exploring the Presence and Benefits of Optimism in a Representative Sample of the World. *Journal of Personality*, 81(5), 429-440.
- Gelles, D. (2019, September 12). Jane Goodall Keeps Going, With a Lot of Hope (and a Bit of Whiskey). Retrieved from <https://www.nytimes.com/2019/09/12/business/jane-goodall-corner-office.html>
- Harmer, J. (2018). Average downloads for new podcasts: 13 Real-world examples and what to expect. Retrieved from <https://incomeschool.com/average-podcast-downloads-new-show/>
- Hussain, Syed Talib, Lei, Shen, Akram, Tayyaba, Haider, Muhammad Jamal, Hussain, Syed Hadi, & Ali, Muhammad. (2018). Kurt Lewin's change model: A critical review of the role of leadership and employee involvement in organizational change. *Journal of Innovation & Knowledge*, 3(3), 123-127.
- Henderson, H. (2015). Ethical markets. Reforming business education for sustainable economies.
- Kotter, J. (2011). Communicating a Vision for Change. Retrieved from [https://www.youtube.com/watch?time\\_continue=40&v=bGVe3wRKmH0](https://www.youtube.com/watch?time_continue=40&v=bGVe3wRKmH0).

- Kotter, J. (1996). *Leading Change*. Harvard Business School Press.
- Metzger, E., Putt del Pino, S., Prowitt, S., Woodward, J., & Perera, A. (2012). *sSWOT A Sustainability Swot*. World Resources Institute.
- Metcalf, L., & Benn, S. (2012). Leadership for Sustainability: An Evolution of Leadership Ability. *Journal of Business Ethics*, 112(3), 369–384.
- NMI. (2013). *LOHAS: Lifestyles Of Health And Sustainability*. U.S. Consumer Perspectives and Trends in Sustainability.
- Patel, S. (2016, June 27). 8 Ways podcasters can profit from their shows. Retrieved from <https://www.entrepreneur.com/article/277912>
- Peter, P., & Honea, H. (2012). Targeting Social Messages with Emotions of Change: The Call for Optimism. *Journal of Public Policy & Marketing*, 31(2), 269-283.
- Podcast focuses on creative sustainable solutions to environmental issues. (2018, Sep 17). University Wire Retrieved from <http://login.ezproxy1.lib.asu.edu/login?url=https://search-proquest-com.ezproxy1.lib.asu.edu/DocView/2105003567?accountid=4485>
- Podcast Paradise. (2020). The #1 Online Community for Podcasters. Retrieved from <https://podcastersparadise.com>
- Podtrac. (2018). Podcast measurement. Retrieved from <http://analytics.podtrac.com/podcast-measurement>
- Poushter, J. (2017, March 20). Smartphone ownership and internet usage continues to climb in emerging economies. Retrieved from <http://www.pewglobal.org/2016/02/22/smartphone-ownership-and-internet-usage-continues-to-climb-in-emerging-economies/>
- Schaltegger, S., & Wagner, M. (2011). Sustainable entrepreneurship and sustainability innovation: categories and interactions. *Business Strategy and the Environment*, 20(4), 222–237.
- Scott, C., & Esteves, T. (2013). *Leadership for Sustainability and Change*. Dō Sustainability.
- Smith, T. (2011). Using critical systems thinking to foster an integrated approach to sustainability: a proposal for development practitioners. *Environment, Development and Sustainability*, 13(1), 1–17. doi: 10.1007/s10668-010-9243-y

- Stave, K., & Sterman, John D. (2002). Using system dynamics to improve public participation in environmental decisions. *System Dynamics Review*, 18(2), 139-167.
- Sustainability and Resilience. (2020a). @sustainability\_and\_resilience Instagram Page. Retrieved from [https://www.instagram.com/sustainability\\_and\\_resilience/](https://www.instagram.com/sustainability_and_resilience/)
- Sustainability and Resilience. (2020b). @sustainabilityandresilience Facebook Page. Retrieved from <https://www.facebook.com/sustainabilityandresilience/>
- Sustainability and Resilience. (2020c). Sustainability and Resilience Patreon Page. Retrieved from <https://www.patreon.com/sustainabilityandresilience/>
- Sustainability and Resilience. (2020d). Sustainability and Resilience Podbean page. Retrieved from <https://www.podbean.com/>
- Sustainability and Resilience. (2020e). Sustainability and Resilience Website. Retrieved from <https://www.sustainabilitypod.com/>
- Taylor, A., Bancelhon, C., Oger, C., & Morris, J. (n.d.). Five-Step Approach to Stakeholder Engagement: Reports. Retrieved from <https://www.bsr.org/en/our-insights/report-view/stakeholder-engagement-five-step-approach-toolkit>
- University of California Los Angeles. (n.d.). What is Sustainability? Retrieved from <https://www.sustain.ucla.edu/about-us/what-is-sustainability/>
- University of Exeter. (n.d.). The Change Curve. Retrieved from [https://www.exeter.ac.uk/media/universityofexeter/humanresources/documents/learningdevelopment/the\\_change\\_curve.pdf](https://www.exeter.ac.uk/media/universityofexeter/humanresources/documents/learningdevelopment/the_change_curve.pdf)
- United Nations. (1987). Report of the World Commission on Environment and Development. Retrieved from [https://www.are.admin.ch/are/en/home/sustainable-development/international-cooperation/2030agenda/un-\\_milestones-in-sustainable-development/1987--brundtland-report.html](https://www.are.admin.ch/are/en/home/sustainable-development/international-cooperation/2030agenda/un-_milestones-in-sustainable-development/1987--brundtland-report.html)
- Werbach, A. (2009). *Strategy for sustainability: a business manifesto*. Boston, MA: Harvard Business Press.
- Winn, R. (2019, March 06). 2019 Podcast Stats & Facts (New Research from Mar 2019). Retrieved from [https://www.podcastinsights.com/podcast-statistics/#Global\\_Podcast\\_Stats](https://www.podcastinsights.com/podcast-statistics/#Global_Podcast_Stats)

## Appendix A

### Strategic Objectives, Vision, Shared Vision, and Mission

#### **Strategic Objectives**

- Sustainability issues require urgent analysis and there is a dire need for action due to the recent changes in the scale of human activity, and the following impacts. Everyone can do their part and contribute to small changes that add up to societal shifts. S&R podcast empowers listeners to understand sustainability challenges and needs to attract new listeners with marketing about what the podcast's vision.
- Use science-based, intriguing and relatable stories issues impacting the world today so that listeners are more likely to listen, and then act on the 'What Can You Do?' call's to action.
- Instate a listener email write-in program that allows listeners to share their ideas, thoughts, stories and sustainability efforts. Create a sense of community by opening dialogs, while also spurring interest in listeners, and sharing important sustainability challenge information.
- Initiate collaborations with other podcasts and professionals.
- Create a vision and a simple vision and call to action for main audience.
- Communicate the vision of the podcast to listeners to increase listenership, listener loyalty and listener donations.
- Explain the systems involved with a sustainability challenge, and the background of the challenge.
- Include feel good, short-term win announcements for listener base and podcast team.
- Become profitable through listener donations and advertisement slots.
- After alpha and beta test episodes, release one episode a month, indefinitely and as long as possible. Each month, review feedback and incorporate it into the next episode.

#### **Vision Statement**

An optimistic sustainability podcast, inspiring collective changes through entertainment.

#### **Shared Vision and Call to Action**

Listen today for a more sustainable future!

#### **Mission Statement**

Podcasting today to empower people for a more sustainable future.

## Appendix B

### Communication Plan

#### **Overall Communications Objective**

Grow the number of listeners and supporters of the podcast; communicate vision.

#### **Synthesized Message for All Audience Segments**

‘Listen to this podcast to be entertained while listening to informative stories, grow alongside us, and support this podcast because you want the sustainability conversation to continue’

#### **Audience Segment-based Planned Communication**

**Listener Base Segment.** Communication objective for the listener base audience segment is to attract new listeners and influence them to become part of the solution for sustainability challenges. The channels and frequency will be at the beginning of each episode, in blog posts, social media posts and advertisements for the podcast.

##### *Messages.*

- “Listen today, for a more sustainable future!”
- “An optimistic sustainability podcast, inspiring collective changes through entertainment”
- “Be entertained for FREE! Expand your mind! Join a community of learners and explore ways that help you change the world by becoming a listener today!”
- “So often in our society we focus on the negative, on mistakes that we have made in the past. Although those mistakes are worth learning about, they are not worth solely focusing on. S & R inspires the kind of thinking that brings realistic hope for the future by focusing on what society is doing well, and what we can do to help the world and ourselves rebound from recent challenges.”

**Listeners Acting on the Call for Sustainable Choices Segment.** Communication objectives are to motivate listeners with feel good, simple calls to action that they can easily achieve to be more sustainable. Even if most actions are out of reach from listeners abilities, all listeners will be able to act on the call to discuss the topic and what they think about it with others to spread awareness and stimulate sustainability thinking. At the section of simple calls to action, or “here is what you can do to make a difference” segment, of every episode the hosts can discuss what it means to act on these calls. This can be mentioned at the beginning and end of the episodes in

relation to communicating the vision of the podcast. Infographics with short messages can also communicate these action items, and how important they are for changing the world with collective action.

***Messages.***

- “Here is what you can do to make a difference... [simple calls to action]”,
- “Together, we can face these challenges with the best understanding of the world as humanly possible and can collectively have monumental impacts on the world.”

**Listener Write-In Program Segment.** Communication objectives are to influence listeners to write to sustainabilitypod-@gmail.com to share their own stories. The podcast needs to continue to grow the amount of listener write-ins. Every regular episode, at the end of show ask for write-ins about discussion topics of the month as well as any stories or challenges they have or are currently facing. Short, or mini episodes will be released monthly, between full episodes, that include listener write-in stories and optimistic, brief sustainability current news stories.

***Messages.***

- “Join our community of learners and share your own challenges or successes with the podcast in our listener story mini episodes.”
- “Become part of the community while helping to inspire others with sustainability collaboration and sharing.”
- “United, people’s knowledge is greater, their problem-solving abilities are greater, and their solutions are more effective.”

**Supporters Segment.** Communication objectives are that listeners, listener write-in participants, subscribers, and sponsors all need to know our vision, and why they should support us. There is also a long-term goal to increase the number of listener donations and patrons via Patreon.

***Messages.***

- “By supporting our show, you are helping us to make the world a more sustainable place.”
- “We could not do this without support from listeners like you, thank you!”
- “If you want to support our show, please download, rate and subscribe.”
- “Reviews, ratings, downloads and subscriptions are all forms of support for us, and we thank you all for supporting us so much!”



- “Thank you very much for your donation! It will go towards helping make this world more sustainable and promoting a culture of continuous learning.”
- “We sincerely appreciate your support and look forward to future episodes that open important sustainability dialogs with listeners like you!”

## Appendix C

### Feedback from Test Listener Audience

#### **Alpha Test Feedback**

- Needed conversation at the end that applied the information to other places and things
- More critical thought and perspective
- Sound range, tone and loudness
- Cotton mouth sound
- Editing Mistake, needed a 3rd final listen all the way through

#### **Beta Test Feedback**

- Flow of conversation, sounded like host was reading script
- Background noise
- Humor, difficult to joke when listeners are in a negative headspace
- Source transparency, information repository or podcast blog Podcast website
- Clear call to action
- Communicate mission more and more clearly
- Easier for all levels of technology users to find our podcast and listen

#### **Pilot Feedback**

- Make it easier for supporters to find how to support us
- Topic selection, systems thinking
- Podcast merchandise
- Tiers on Patreon and specialized benefits for supporting us
- Ease of access to podcast and modes of support for listeners
- Ease of access to podcast and modes of support for listeners
- Communicate the vision more, open more two-way communication channels
- Find methods to ensure sustainability lens is used and information discussed is seen as very credible
- Links don't work all the time, hard to find on Spotify when searched
- Got off to a slow start
- Background noise
- Add About Us Page to Website

Appendix D  
Developing Podcast Episode Content  
**Structure for Selecting Topics**

1. Select prospective topic
2. Identify social, environmental, economic impacts
3. Identify potential areas of resilience
4. Create initial systems diagram
5. Create boundaries for approx. 45 min episode(s)

**Framework for Developing Episode Topics**

1. Research for Variables
2. Create Causal Loop & Pinpoint Leverage Points
3. Identify Past, Present and Ideal Future States
4. Provide Easy, Achievable, and Effective CTA's
5. Brainstorm Discussion Questions

**Outline for Scripts**

Introduction

- Episode Topic Attention Grabber / About Us / Podcast Overview

Sustainability Challenge

- Problem Definition
- History and Root Causes of Problems / Current State of Problem
- Ideal Future and Leverage Points

Together, We Can! Listener Actions for Sustainable Change

- What can listeners do to help ease pressure on underlying systems impacting problem

Discussion

- Questions / Comments / Thoughts

Closing

- Sources / Blog / Thank You / Podcast Mission Support

Appendix D  
 Monthly Schedule for Podcast Team

**Figure D1**

*Monthly Gantt chart for the Production of each Episode and Mini-Episode*

	<i>Week</i>			
	1	2	3	4
Research Topic	█			
Team Meeting about Research				
Write Script		█		
Team Meeting about Script and Write-in Mail				
Record			█	
Edit, Add Intro & Transitions, Export as MP3				█
Team Meeting about Edits, Finalize Episode				
Tag MP3 in iTunes and Podbean				█
Upload to Podbean, Schedule Publishing				█
Write Blog Post, Publish				█
Post on Instagram, Facebook and Patreon				█
Collect, Review and Respond to Listener Feedback				█
Collect download metrics, consolidate learnings				█

**Figure D2**

*Monthly Schedule for the Production of each Episode and Mini-Episode*

Podcast Production Schedule							
	<i>Monday</i>	<i>Tuesday</i>	<i>Wednesday</i>	<i>Thursday</i>	<i>Friday</i>	<i>Saturday</i>	<i>Sunday</i>
<i>Week 1</i>	<b>Research</b>					Team Meeting	
<i>Week 2</i>	<b>Write Script</b>					Team Meeting	
<i>Week 3</i>	<b>Record</b>	<b>Edit</b>			<b>Blog Post</b>	Team Meeting	Final Edits
<i>Week 4</i>	<b>Publish</b>	<b>Market</b>					<b>Collect Feedback</b>

*Note: Bold tasks are critical for episode completion.*

Appendix E

Podcast Webpage SustainabilityPod.com

**Figure E1**

*Podcast Logo and Image of Top of Home Page*



**Figure E2**

*Home Page Infographics*

**An optimistic  
podcast exploring  
sustainability  
issues.**

Journey through a thought-provoking sustainability topic each episode, as hosts Kate and Brian focus on seeing the world's challenges as opportunities.

**Listen Today  
for a More  
Sustainable  
Future**

**Figure E3**

*Buttons on Home Page*

**Figure E4**

*Explanation of Mini Episode Write-in Program on Webpage*

Join the Listener Write-in Program

*Email Us At*

[SustainabilityPod@gmail.com](mailto:SustainabilityPod@gmail.com)

Mini-episodes will share our listeners' hometown sustainability challenges and thoughts about questions in episodes, like 'what do you consider sustainable seafood?'

Listen, learn and share with us to have fun exploring sustainability!



**Figure E5**

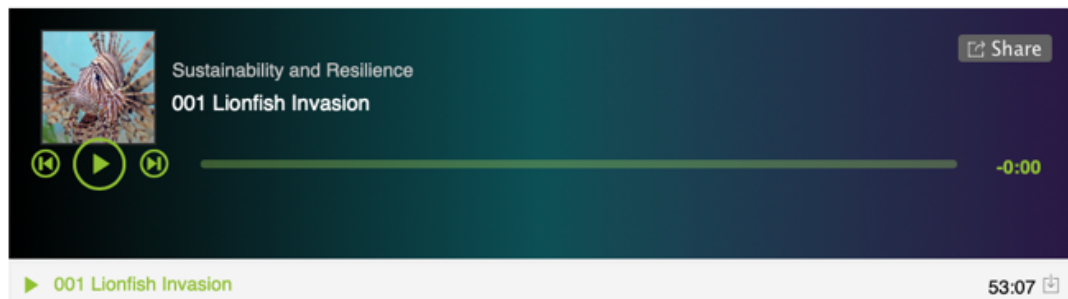
*Sponsor Images and Buttons on Webpage*





**Figure E6***Sustaina-blog Post for Lionfish Invasion Episode*

Posted on February 3, 2020

**Lionfish Invasion****The Ultimate Sustainable Seafood?***By Kate Cheney and Brian Perkins*

Lionfish in the Atlantic, the Caribbean Sea and the Gulf of Mexico have become an invasive, destructive force on the native ecosystems of these areas. With the growing numbers of lionfish in recent decades, humans have become the most crucial predator of these fish. Deemed 'the ultimate sustainable seafood', the lionfish has demanded that people adapt quickly to its now thorough infestation in the Western Atlantic region.

**Reef Ecosystems in the West Atlantic**

The greater area of the Western Atlantic, including the Gulf of Mexico and the Caribbean Sea, is one of the most densely and diversely populated marine regions in the world. These reefs are the native home to around 1200 species of fish and 50 species of reef-building corals.

Over thousands of years, the complicated ecosystems in these areas worked out a biodiverse balance. Our fisheries, economies, and way of life are reliant on these ecosystems staying in balance. The introduction of a new species disrupts the entire system, especially when that species is invasive.

### Destructive Lionfish Invasion

A single lionfish can reduce the fish biomass on a reef by 80% in just one month, eating up to 20 fish in 30 minutes and up to ½ their body size. Lionfish are particularly adept at eating herbivore and juvenile fish in the reefs.

Herbivore or algae eating fish are important to keep corals from being smothered by algae growth. There are also some commercially important species of fish that use the reef structure as protection until they become large enough to survive in the open ocean. Lionfish consume them as fingerlings, thus harming not only the reef health but also the local economy.

The lionfish is drastically changing and disrupting the food chains holding the marine ecosystems together. As these chains are disrupted, declining densities of other fish populations are found, as well as declines in the overall diversity of coral reef areas.

### Lionfish as a Sustainable Seafood

With no apparent limit to their population growth, other than water temperature, lionfish pose a huge threat to the fish stock of the western Atlantic Ocean. Lionfish are the ultimate sustainable seafood because they are an invasive species and we are trying to reduce their population. We can never 'over harvest' lionfish and the popular Monterrey Bay Aquarium Seafood Watch has listed lionfish as one of the 'best choice' sustainable seafood's to eat.

Here are a few things you can do to help control the lionfish populations in the Atlantic:

Spread the word! Share educational lionfish-related articles and start conversations about the issue with others.

Eat lionfish! They are delicious and are a truly guilt-free fish. You can find lists of restaurants that serve lionfish online.

Donate to organizations that promote lionfish management and conservation.

If you snorkel or dive, get your own equipment and catch lionfish. Make sure you are comfortable with your diving skills, conditions, environment and know the safe lionfish hunting practices. Also, educate yourself on all local regulations on lionfish hunting.

## What do you consider sustainable seafood?

Email us to share your thoughts!

[SustainabilityPod@gmail.com](mailto:SustainabilityPod@gmail.com)

### Sources

[The Beautiful Depredator: a Story of Lionfish Invasion](#)


[Monterrey Bay Aquarium Seafood Watch](#)

[Total mercury levels in invasive lionfish, \*Pterois volitans\* and \*Pterois miles\* \(Scorpaenidae\), from Florida waters](#)

[The Lionfish Problem](#)



[6 Reasons to Eat Lionfish](#)

### Restaurants Serving Lionfish



Where to eat lionfish? Hungry for lionfish or ready to try this delicious fish for the first time? Ever wondered what lionfish tastes like and want to satisfy your culinary curiosities? Contrary to what you may have been told, lionfish is not poisonous and is safe to eat where it is served! Create a demand for lionfish ...

[Continue reading](#)

 **Lionfish Hunting Lodge** 50 



Leave a Reply

Logged in as [sustainabilituandresiliencepod](#). [Log out?](#)

COMMENT

Post Comment

References

Sustainability and Resilience. (2020). Sustainability and Resilience Website. Retrieved from <https://www.sustainabilitypod.com/>

Appendix F

Marketing, Advertising and Social Media Posts

**Figure F1**

*Facebook Post, Boosted for Advertisement, Reaches 451 people and Engages 9 people*

**Sustainability and Resilience**  
Published by Kate Cheney [?] · February 5 · 🌐

The podcast has a website!  
Now you can find all the sources from our episodes, the Sustaina-blog, info on the listener write-in program, and more!

SUSTAINABILITYPOD.COM  
**Lionfish Invasion – Sustainability and Resilience Podcast**  
Lionfish Invasion Posted on February 3, 2020February 5, 2020 by Th...

**451** People Reached      **9** Engagements      [Boost Again](#)

Boosted on Feb 5, 2020      Completed  
By Kate Cheney

People Reached	<b>431</b>	Post Engagement	<b>118</b>
----------------	------------	-----------------	------------

[View Results](#)

Figure F2

Instagram Page with over 700 followers

The image shows a screenshot of an Instagram profile for 'sustainability\_and\_resilience'. The profile features a circular logo with the text 'SUSTAINABILITY AND RESILIENCE'. The bio states 'Sustainability and Resilience' and 'An optimistic sustainability podcast!' with a link to 'sustainabilitypod.com'. The profile has 32 posts, 733 followers, and 4,402 following. The main content area displays a grid of posts: a close-up of a lionfish, a promotional graphic for the podcast with logos for podcasting apps, a graphic with the podcast logo, a list of sustainability actions, a graph showing overshoot and carrying capacity over time, and a diagram of photosynthesis and nutrient uptake in a plant.

**SUSTAINABILITY AND RESILIENCE**

32 posts 733 followers 4,402 following

Sustainability and Resilience  
An optimistic sustainability podcast!  
[sustainabilitypod.com](http://sustainabilitypod.com)

POSTS IGTV SAVED TAGGED

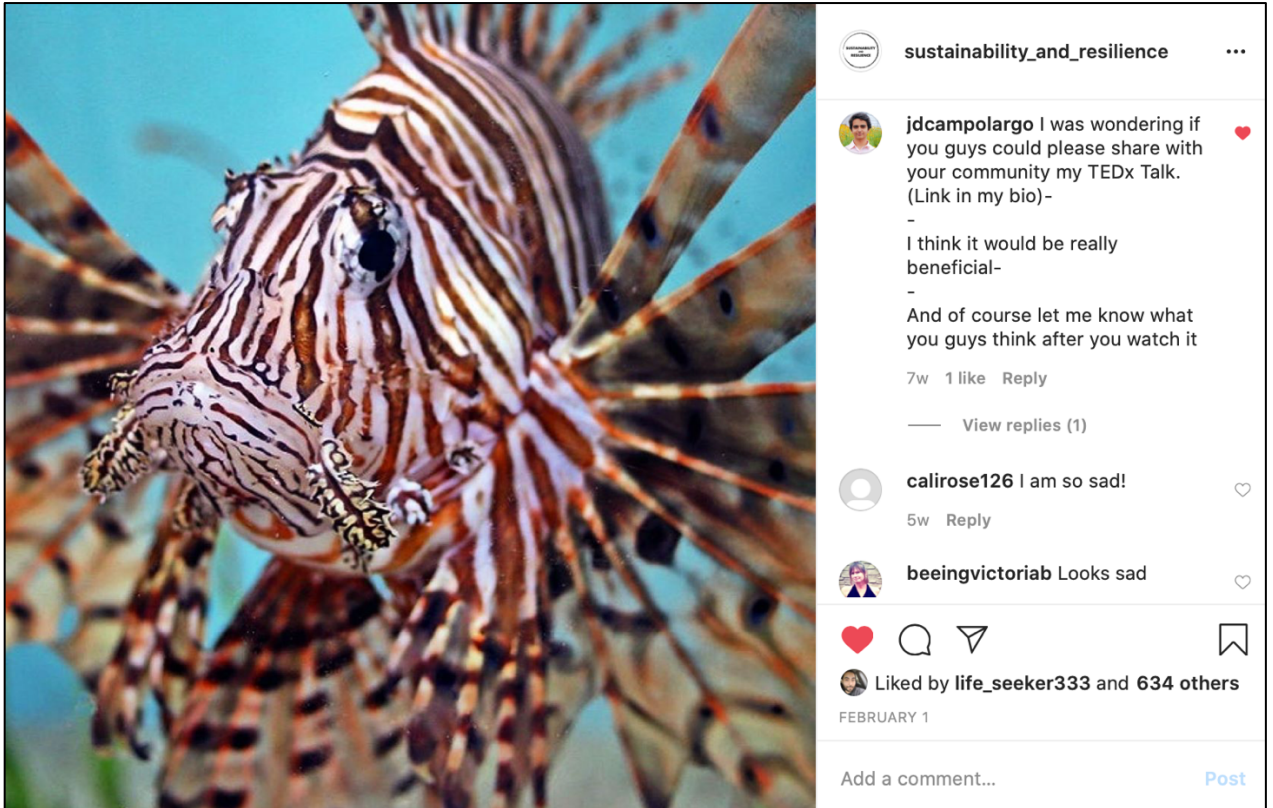
reduced  
reused  
repaired  
refurbished  
resold  
recycled  
or composted  
**If it can't be** \_\_\_\_\_ ,  
restricted  
redesigned  
removed from  
**then it should be** \_\_\_\_\_ production .

Carrying Capacity  
Overshoot  
Time

Sunlight  
Light Energy  
Carbon Dioxide  
Oxygen  
Glucose  
Root  
Water  
Minerals

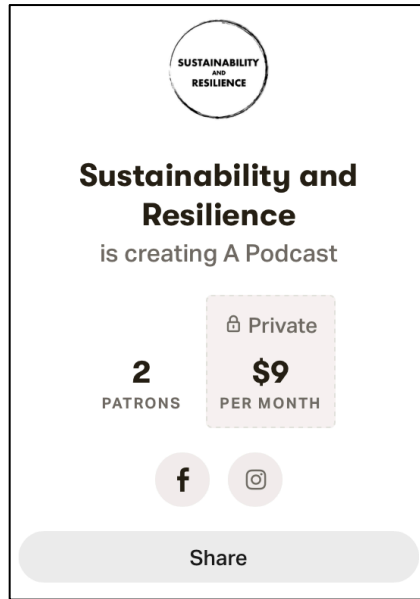
**Figure F3**

*Instagram Post about Lionfish Episode with over 630 Likes and 4 Comments*



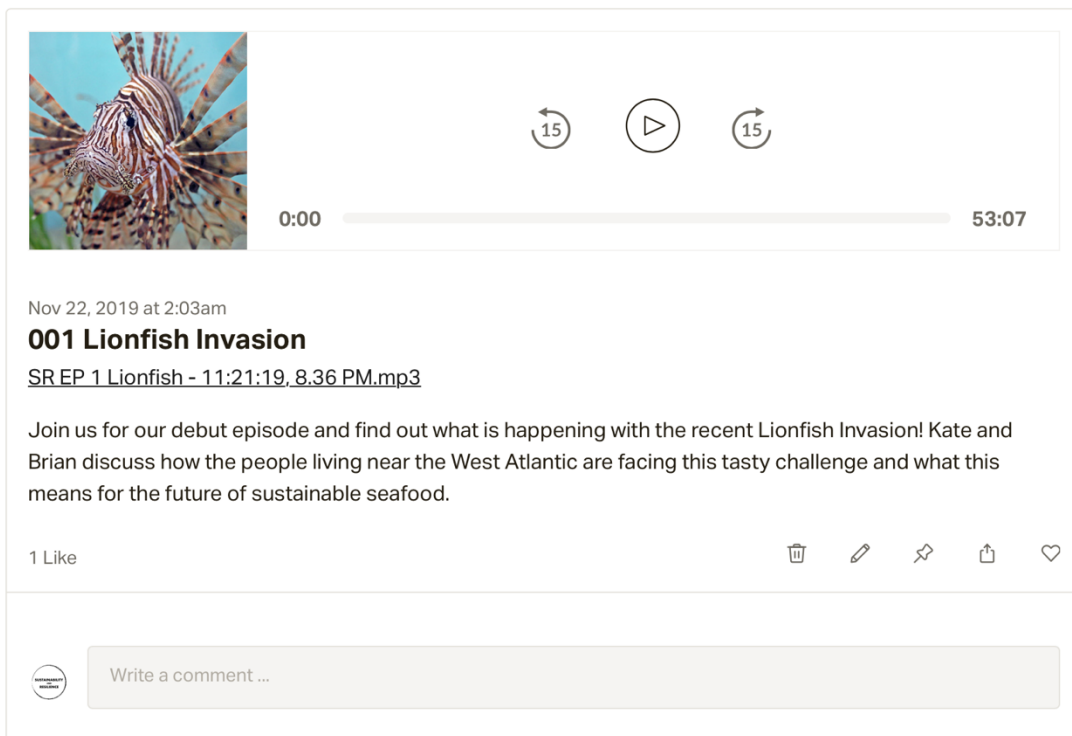
**Figure F4**

*Patreon Page Showing 2 Patrons Donating a Combined \$9/month*



**Figure H2**

*Patreon Post of Beta Episode for Patrons*





## References

Sustainability and Resilience. (2020a). @sustainability\_and\_resilience Instagram Page.

Retrieved from [https://www.instagram.com/sustainability\\_and\\_resilience/](https://www.instagram.com/sustainability_and_resilience/)

Sustainability and Resilience. (2020b). @sustainabilityandresilience Facebook Page. Retrieved

from <https://www.facebook.com/sustainabilityandresilience/>

Sustainability and Resilience. (2020c). Sustainability and Resilience Patreon Page. Retrieved

from <https://www.patreon.com/sustainabilityandresilience/>

Appendix G

**Figure G1**

*Podbean Home Page Showing Episode 001 Lionfish Invasion and about 70 downloads*

# Sustainability and Resilience

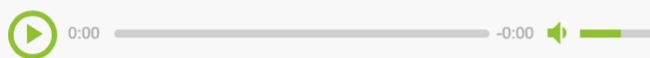
*Join hosts Kate and Brian as we journey through an interesting sustainability topic each episode of Sustainability and Resilience. Listen, learn and share with us to have fun exploring sustainability!*

## 001 Lionfish Invasion

*Jan 1st, 2020 by sustainabilityandresilience*



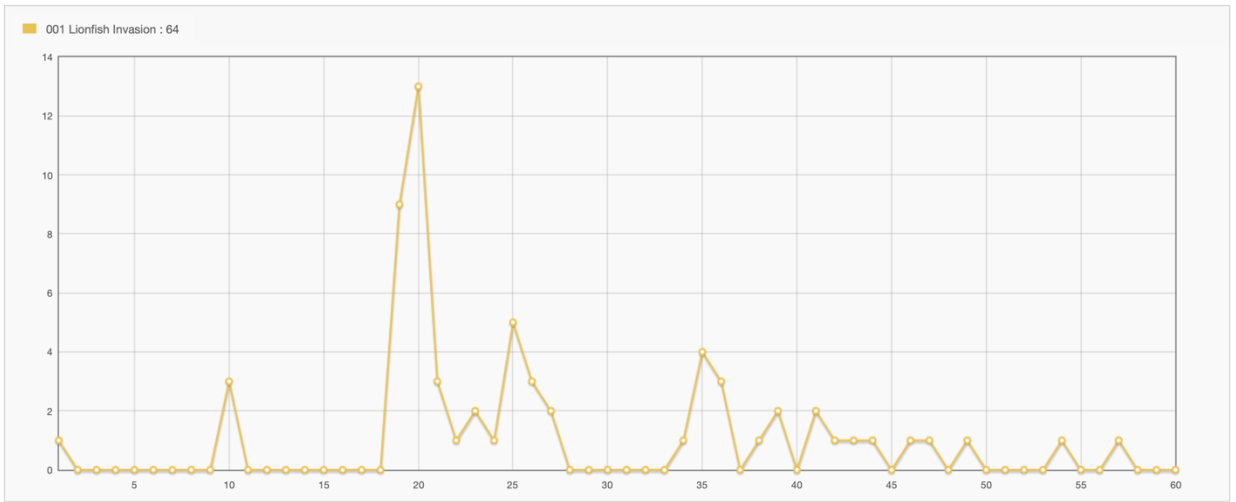
Join us for our debut episode and find out what is happening with the recent Lionfish Invasion! Kate and Brian discuss how the people living near the West Atlantic are facing this tasty challenge and what this means for the future of sustainable seafood.



♡ Liked(1) ↗ Share ⬇ Download(68)

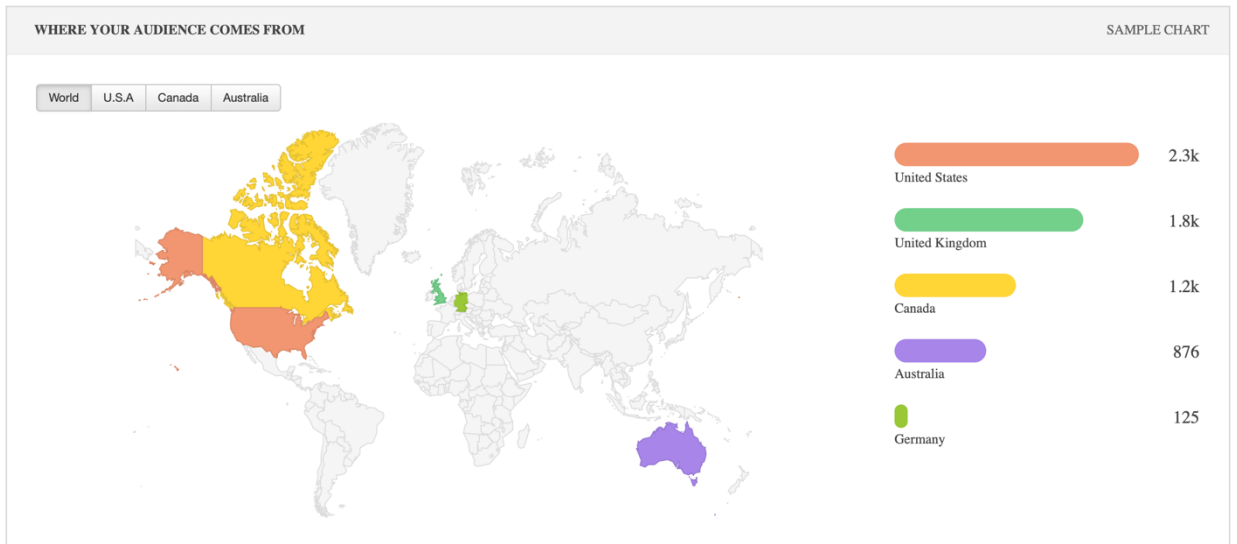
**Figure G2**

*Podbean Graph of 68 Downloads over 90 Days, of Episode 001 Lionfish Invasion*



**Figure I3**

*Podbean Map of Listeners Geographic and Demographic Information*



References

Sustainability and Resilience. (2020). Sustainability and Resilience Podbean page. Retrieved from <https://www.podbean.com/>

Appendix H  
Script for Episode #001 The Lionfish Invasion

**Introduction**

Hello and thank you for joining us for this episode of Sustainability and Resilience. I am Kate Cheney here with Brian Perkins. And we are here to talk about stories and talk about when humanity has encountered sustainability issues and risen to be resilient. Our topic today is The Lionfish Invasion! Lionfish in the Atlantic, Caribbean Sea and Gulf of Mexico have become an invasive, destructive force on the native ecosystems of these areas. With the growing numbers of lionfish in recent decades, humans have become the most crucial predator of these fish. Deemed ‘the ultimate sustainable seafood’, the lionfish has demanded that people adapt quickly to its now thorough infestation in the Western Atlantic region.

**Reef Ecosystems**

The greater area of the Western Atlantic, including the Gulf of Mexico and Caribbean Sea is one of the most densely and diversely populated marine regions in the world. These reefs are the native home to around 1200 species of fish and 50 species of reef-building corals (Dip 'N Dive Inc., 2017). Over thousands of years, the complicated ecosystems in these areas worked out a biodiverse balance. Our fisheries, economies and way of life are reliant on these ecosystems staying in balance. The introduction of a new species disrupts the entire system, especially when that species is invasive.

**Destructive Lionfish Invasion**

Lionfish are easily identified by their venomous spines and stunning white and dark red stripes. The red lionfish, originally from Indo-West Pacific, was likely first introduced off the Florida coast in the early to mid-1980s (Dip 'N Dive Inc., 2017). It is not exactly clear how they traveled to the other side of the world, but people think it could have been a mixture of ballast water, aquarium enthusiasts releasing unwanted fish and a beachside aquarium damaged in Hurricane Andrew in 1992. Lionfish are kind of super fish in that they rapidly reproduce and grow quickly, have a broad and dynamic habitat range and are voracious eaters, eating a large amount and variety of fish. It takes about a year for a lionfish to mature, spawning 30,000 eggs every 4–5 days, or about 2 million eggs per year.

Scientists estimate that lionfish populations are about 17X denser in the areas they have invaded compared to their native habitat. The population continues to expand rapidly as there are

few predators to keep the populations in check. When hunting, they corner prey using their large fins, then use their quick reflexes to swallow the prey whole. Lionfish are not recognized by their prey in the Atlantic, which makes them very effective predators. A single lionfish can reduce the fish biomass on a reef by 80% in just one month, eating up to 20 fish in 30 minutes and up to ½ their body size (Dip 'N Dive Inc., 2017).

Lionfish are particularly adept at eating herbivore and juvenile fish in the reefs. Algae eating fish are important to keep corals from being smothered by algae growth. There are also some commercially important species of fish that use the reef structure as protection until they become large enough to survive in the open ocean. Lionfish consume them as fingerlings, thus harming not only the reef health but also the local economy. The lionfish is drastically changing and disrupting the food chains holding the marine ecosystems together. As these chains are disrupted, declining densities of other fish populations are found, as well as declines in the overall diversity of coral reef areas. With no apparent limit to their population growth, other than water temperature, lionfish pose a huge threat to the fish stock of the western Atlantic Ocean.

### **The Ultimate Sustainable Seafood**

Lionfish are the ultimate sustainable seafood because they are an invasive species and we are trying to reduce their population. We can never ‘over harvest’ lionfish and the popular Monterey Bay Aquarium Seafood Watch has listed lionfish as one of the ‘best choice’ sustainable seafood’s to eat (Monterey Bay Aquarium, n.d.). Why eat lionfish? It’s a light, white, flaky meat similar to snapper and has a relatively neutral flavor. You can prepare it any way that you prefer to eat your fish. I read its good grilled, sautéed, baked – chefs say it is very versatile (Lowe, 2017). Lionfish tacos?! Chefs can also create stunning presentations of whole lionfish on the plate as well, since cooking neutralizes the venom in the spines.

I have never tried lionfish before but, as I know with other predator fish, there can be bioaccumulation of toxins, like mercury. Lionfish actually have less mercury than other popular fish. In one Florida study, they were found to have 13X less mercury than Grouper and 3.5X less than Yellow Fin Tuna (Tremain & Odonnell, 2014). This is due to the fact that lionfish, being relatively small, feed on relatively small fish that have not built up a lot of mercury in their systems. It’s also considered a very healthy choice of fish to eat as lionfish have higher

concentrations of heart healthy Omega 3 fatty acids aka good cholesterol and lower concentrations of Omega 6 fatty acids or bad cholesterol.

Because lionfish are rarely caught on hook and line, they need to be hunted by spearfisherman using scuba gear. Hunting lionfish is labor intensive, and there is no such thing as large commercial vessels scooping up large quantities of lionfish like with many other species. The vast majority of commercially harvested lionfish come from individual divers, supplementing their income. General spearfishing and hunting is making a difference in nearshore lionfish numbers as humans become more of a much-needed predator to these fish. Divers events include Lionfish Derbies where divers compete to catch the most before sundown for a prize.

These events raise public awareness, often offering different lionfish cuisines to locals. Derbies also help scientists gather information and samples to further analyze the species. This method of population control works well for nearshore, shallow reefs; however, lionfish can live up to 1000 of feet below the surface. While diving in Bermuda, RSE founders came face-to-face with the lionfish and saw the devastating reduction to biodiversity and damage to the coral reef that these voracious fish were creating (Robots in Service of the Environment, n.d.). They designed a robot to identify, stun and capture lionfish at 1000 ft, where populations are expanding unchecked. This robot is widely deployable and economically self-sustaining as the market demand for lionfish continues to raise.

#### **Here are a few things you can do to help control the lionfish populations in the Atlantic:**

Spread the word! Share educational lionfish-related articles and start conversations about the issue with others. Eat lionfish! They are delicious and a truly guilt free fish. You can find lists of restaurants that serve lionfish online (Harrel & Lowe, n.d.). Donate to organizations that promote lionfish management and conservation. If you snorkel or dive, get your own equipment and catch lionfish. Make sure you are comfortable with your diving skills, conditions, environment and know the safe lionfish hunting practices. Also, educate yourself on all local regulations on lionfish hunting.

#### **Act 4: Discussion**

If only more of the world's problems tasted so good... Thank you for listening. If you liked this episode and want to stay tuned for more, please rate us, download and subscribe. Check us out on Instagram and Facebook, or at [sustainabilitypod.com](http://sustainabilitypod.com) If you would like to be a

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#### References

- Robots in Service of the Environment. (n.d.). Retrieved from <https://www.robotsise.org/>
- Tremain, D. M., & Odonnell, K. E. (2014). Total mercury levels in invasive lionfish, *Pterois volitans* and *Pterois miles* (Scorpaenidae), from Florida waters. *Bulletin of Marine Science*, 90(2), 565–578. doi: 10.5343/bms.2013.1025
- Monterey Bay Aquarium. (n.d.). Seafood Search: Lionfish Recommendations. Retrieved from <https://www.seafoodwatch.org/seafood-recommendations/groups/lionfish>
- Lowe, A. (2017, March 27). 6 reasons lionfish should be your first choice of fish. Retrieved from <https://lionfish.co/why-eat-lionfish/>
- Dip 'N Dive Inc. (2017, May 17). The Beautiful Depredator: a Story of Lionfish Invasion. Retrieved from <https://dipndive.com/blog/the-beautiful-depredator-a-story-of-lionfish-invasion>
- Harrel, L. S., & Lowe, A. (n.d.). Where to eat lionfish? Restaurant Serving Lionfish When Available. Retrieved from <https://lionfish.co/eat-lionfish-here/>



## Appendix I

## Episode 000 Version A Script

**Chesapeake Bay's Iconic Bivalve**

**Attention Getter/Introduction.** Today, the Bay's native oyster population is estimated to be 1% of historic levels. Over-harvesting, disease and habitat loss have led to a severe drop in oyster populations (Goldsborough & Pelton, 2010). Chesapeake Bay, where ten tributaries join to create a large watershed, is one of only two places left on earth where an industry still exists based on harvesting oysters from the wild. Nearly everywhere else, oysters are produced in aquaculture farms. In France, England, the U.S. West Coast, Japan, Australia, and elsewhere, oyster reefs have been almost completely eliminated by overharvesting, pollution, and disease, with these diseases often the result of the introduction of exotic oyster species

**Factual Information**

**Social.** Atlantic Oysters (vs Pacific oysters) have been harvested here for thousands of years and before the 19<sup>th</sup> century, they were so prolific, they could be gathered by hand in the shallows. Continuing today, they are a food source and part of the region's cultural heritage.

**Environmental.** Critical keystone (native) species for the ecosystem (water clarification and habitat building). Oyster reefs are ecologically important because they filter algae, sediment and chemicals contaminants. They create the structure by sticking to each other, and empty shells cementing on top of each over the years creates the reef habitat. Reef for fish and all types of creatures to live in. (Chesapeake: A Journalism Collaborative, n.d.). Part of the food chain, anemones, crabs, birds and humans

**Economic.** Oysters were the Bays most valuable fishery product. The decline of oysters has meant a loss of more than \$4 billion for the economies of Maryland and Virginia over the last three decades (NOAA). Annual harvests dropped from \$207 million in the 70's to just 13 million by 2008. This revenue not only helped fisherman and harvesters but restaurants, seafood processors, equipment manufacturers and boat builders. Waterfowl hunters and fishermen impacted heavily by the collapse of oyster reefs

**Sustainability Challenge**

Chesapeake derived from an Algonquin word mean "Great Shellfish Bay". By 1890, nearly 120 million pounds of oysters were being harvested annually by boat and dredge (Pollard, 2019). Harvests started to decline for one of the region's most important industry. Between 1910

and 1930, the oyster harvest dropped to  $\frac{1}{4}$  of those thirty years prior. The industry took a hit and harvest rates actually stabilized for a few decades. Then in the late 50's, further devastation struck with the emergence of new oyster diseases. Harvests decreased by another 50%, about  $\frac{1}{8}$ <sup>th</sup> of historical harvest rates. In the 60's, the community came together and formed action groups made up of businessmen, sailors, waterfowl hunters, fishermen and oyster harvesters. Focus efforts on water quality pressures putting further stress on the reefs. These groups really made a difference for the oyster population and harvest rates equalized again

Agriculture in the surrounding areas grew and slowly changed fertilizing, tilling and pest control practices. Runoff from these farms, full of nutrients, sediment and chemicals made its way to the Chesapeake Bay. Here, these polluted waters created dead zones that had low or no oxygen levels that suffocated entire oyster reefs at a time. This eutrophication, along with the introduction of invasive species such as the zebra clam lead to even further collapse. The year 1985 saw a huge plunge in harvest amounts, 15 million pounds to around 5 million pounds, and the oyster harvest hit an all-time low (Chesapeake Bay Program, n.d.). Grim times for whole community. The 90's saw the formation of community action groups, The Oyster Roundtable and governmental efforts to help keep the oysters alive and hopefully bring the industry back to life.

Wild oyster populations had taken such a hit that in 2009, oyster farming on leased water bottom was legalized for the first time. Because of the oyster lifecycle, the first harvest was in 2013. In, 2010 Maryland passes Oyster Restoration and Aquaculture Development Plan, and now 24% of the wild oyster habitat is now off-limits to farmers. Other restoration efforts are now strategically spread across the region and watershed.

### **Resiliency and the Future, How We Recovered and Changed**

The Chesapeake can become a model of environmental improvement—collaborative restoration based on science that can restore watersheds and clean water across the globe—all while enriching the lives of the watershed's 18 million residents. Oyster sanctuaries need to rest and not be harvested but face illegal poaching. Poachers are kept away from reefs with patrols, prosecution. Harvesters need to have separate areas to harvest planted larvae. After harvest, shells need to be returned to the water to create attachment sites. Restoration biologists have also started constructing artificial reefs with old shells.

Concrete structures called “reef balls” can also help deter poaching by snagging or blocking dredges and other harvesting equipment. There may be less theft of oysters in Virginia, and this could be because this state has more watermen leasing the bottom of the Bay for aquaculture, which encourages a culture of respect for private property. Agriculture sector has and can further efforts of conservation tillage with over 1/3 of the field untilled, cover crops (nitrogen fixers and cash crops), enforced nutrient management, enforced manure and poultry litter management, streamside fencing for livestock, forest buffers at edges of farms.

### **Thoughts for future generations**

Community coming together to address complex problems, impacts everyone in community, also created by everyone in community. Tragedy of the commons. Although depressing to think about how many oysters we have lost by now, Chesapeake Bay truly sets an example of how to save a habitat, species, economy, community and food source from the brink of extinction. Not too late to control other resources through community and governmental collaboration. Importance of individual actions by landowners and residents who collectively can have a big impact on controlling pollution and helping the ecosystem recover.

## References

- Goldsborough, B., & Pelton, T. (2010). *On the Brink: Chesapeake's Native Oysters* (pp. 1–40). Chesapeake Bay Foundation.
- Chesapeake Bay Program. (n.d.). Oysters. Retrieved from <https://www.chesapeakebay.net/issues/oysters>
- Pollard, K. W. (2019, May 31). A brief history of oysters in the Chesapeake Bay. Retrieved from <https://www.baltimoresun.com/food-drink/bal-a-brief-history-of-oysters-in-the-chesapeake-bay-20140603-story.html>
- Chesapeake: A Journalism Collaborative. (n.d.). Chesapeake Bay Collaborative. Retrieved from <https://www.wvtf.org/programs/chesapeake-bay-collaborative#stream/0>

## Appendix J

## Episode 000 Version B Script

**Chesapeake Bay's Iconic Bivalve: The Oyster**

Hello and thank you for joining us for this episode of Sustainability and Resilience. I am your host Kate Cheney here with co-host Brian Perkins. We are here to talk about stories and talk about when humanity has encountered sustainability issues and risen to be resilient. Our topic today is Chesapeake Bay and its most iconic bivalve: the oyster.

Chesapeake Bay is the largest estuary in the US. An estuary is just the connection between a river and the ocean. Chesapeake Bay's watershed spans more than 64,000 square miles across Virginia, Maryland, Delaware, New York, Pennsylvania and West Virginia. A watershed includes the land around rivers where water drains into the rivers from. Over 150 major rivers and streams feed into this Bay, making the watershed very expansive. Over the last two centuries, Chesapeake Bay has lost 99% of its oysters. But the 1% that remains today is a symbol of hope. As one of the only places left on Earth where oysters can still be harvested from the wild, Chesapeake Bay is well known for its resilient oyster industry that has overcome many odds. Most of the oysters you see in the store are farmed in aquaculture because worldwide, oyster reefs have declined by more than 90% over the last hundred years. This story will show how collaboration across industries and jurisdictions can change the outlook of a dwindling resource (Goldsborough & Pelton, 2010).

Atlantic Oysters, native to the area, have been harvested here by humans for thousands of years. Before the 19<sup>th</sup> century, the oysters were so prolific that people often collected from wading into the water or using a small boat near shore to easily pick them off the rocks. Oysters have always been a food source for people and are a part of the cultural heritage of the entire region. Interestingly, the word Chesapeake was derived from the Algonquin word meaning "Great Shellfish Bay". And, by the turn of the 20<sup>th</sup> century, the harvest reached over *1 billion* oysters a year. This was brutal overharvesting for the oyster population. Harvest techniques played a large role in diminishing the oyster's ability to repopulate after a harvesting. Boats dredged the bottom of the bay by dragging large nets to scoop up anything they could (Pollard, 2019). This practice hit the oysters hard.

Oysters stick together with a cement like bond. Over the generations the oysters grow larger and create what is known as an oyster reef, (or more like what is used to be known as). These oyster reefs provide dense structures that create habitat for many ocean creatures, including other oysters. Things got pretty bad over the next 50 years and by the mid 20<sup>th</sup> century, harvest rates had dropped by 75% and the oyster reefs were heavily impacted (Pollard, 2019). Oyster harvests actually stabilized for a few decades until the late 1950's when further devastation struck the oyster population, this time not directly from humans, but from new diseases Dermo and MSX. MSX is a parasite and Dermo is a bacterium, both are fast-spreading and lethal to oysters. With the onset of these diseases oyster populations decreased and harvesters lost half of their haul. The fallout from the introduction of these diseases had impacted more than just the oyster harvesters (Pollard, 2019).

Oysters had become a major industry over the years and had developed an entire economy with many different types of businesses. Restaurants, seafood processors, equipment manufacturers, boat builders, waterfowl hunters and fishermen were all heavily economically impacted by the further collapse of the oyster reefs. Not only did the economic system take a hit, but when the oysters went away, so did the organisms in the ecosystem, such as birds, crabs and fish, that fed on them and used their dense reefs as habitat. Another important function oysters have in the environment was discovered with their decreasing numbers.

Since they are bi valves, they are filter feeders and naturally filter algae, sediment and chemical contaminants from the water. Just one oyster can filter 50 gallons of murky water and filter it into crystal clear water in a single day (Chesapeake Bay Program, n.d.)! The overall water quality of the bay was greatly affected, and the greater area had to do something in order to stop the oyster decline. In the 60's, the Chesapeake Bay community formed grassroot organizations comprised of leaders from many different industries, across state and county lines. Together, businessmen, oyster harvesters, fishermen, conservation and local, state and national government all focused their efforts on addressing the recent water quality concerns.

With community efforts, oyster populations stabilized once more, and the industry actually increases in harvest amounts for nearly two decades. Then, in the 1980's oyster populations were hit with a final blow that would try to seal their unfortunate fate forever. Agriculture in the area surrounding the bay is part of the bays watershed because water that runs off the farm will eventually make its way to the bay and ocean (Chesapeake Bay Program, n.d.).

Technology changed and so did the way farmers fertilized, tilled and managed pest control. Runoff from these farms was full of nutrients, sediment and chemicals made large ‘dead zones’ or ‘death clouds’ in Chesapeake Bay.

These ‘dead zones’ are found where agricultural runoff meets the salty bay waters. They happen when nutrient rich waters rapidly bloom with life, such as algae, then that life, is smothered and dies leaving a hypoxic or ‘no oxygen zone’. One dead zone can suffocate an entire oyster reef and school of fish at a time. After these oyster die-offs, invasive species now had an easy time establishing in the available space, adding yet another pressure to the oyster population. The rapid disbursement of species like the zebra clam brought on another severe decline in oyster population and harvest rates hit an all-time low.

Collaborative efforts had grown by the 90’s to include an even more diverse group of stakeholders than in prior decades. Oyster Roundtables which were what the collaboration events are called, now included agriculture, planning districts, research facilities, educational institutions, health care facilities, non-profits and citizen groups. In 2009, Chesapeake Bay was recognized as a national treasure. Funding became available to aide restoration efforts and local plans sprouting from the Oyster Roundtable collaborations were made. These restoration efforts have increased oyster habitat and decreased the negative water quality issues, causing oyster populations to rebound.

Oyster harvest rates are also now fairly stable and include oyster aquaculture on the bottom of the bay (Chesapeake: A Journalism Collaborative, n.d.). The aquaculture has recently promoted a culture of respect for private property and oyster poaching is decreasing in areas with more aquaculture. Natural sanctuary areas, off-limits to harvest, still need to be protected from illegal poaching. Local law enforcement now patrol and prosecute poachers. Large, hollow, concrete structures called “reef balls” are also used to help deter poaching by snagging or blocking dredges while also providing man-made habitat for oysters and fish. On top of all the habitat protection efforts, agriculture also developed best practices to reduce impacts. Some of these include conservation tillage, streamside animal fencing and forest buffers at edges of farms.

Conservation tillage is where one third of the field is left untilled to reduce sediment in runoff. Streamside animal fencing and forest buffers at edges of farms reduce the amount of chemicals and nutrients that make their way to the rivers as runoff. Enforced nutrient and litter

runoff management is now practiced ensuring farms are not polluting the waters downstream. Chesapeake has become a model of collaboration, showing the world how resilient humanity and the environment can be. Saving the oysters took efforts from the entire community including large institutions to countless individuals, all across a large geographic area. The oysters brought life with them when their habitat was restored and the subsequent environmental improvements led to a more developed oyster economy which also enriched the lives of the millions of residents living near the bay. What we have learned from this story can be replicated and used around the world to restore watersheds and preserve natural resources for future generations.

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## References

- Goldsborough, B., & Pelton, T. (2010). *On the Brink: Chesapeake's Native Oysters* (pp. 1–40). Chesapeake Bay Foundation.
- Chesapeake Bay Program. (n.d.). Oysters. Retrieved from <https://www.chesapeakebay.net/issues/oysters>
- Pollard, K. W. (2019, May 31). A brief history of oysters in the Chesapeake Bay. Retrieved from <https://www.baltimoresun.com/food-drink/bal-a-brief-history-of-oysters-in-the-chesapeake-bay-20140603-story.html>
- Chesapeake: A Journalism Collaborative. (n.d.). Chesapeake Bay Collaborative. Retrieved from <https://www.wvtf.org/programs/chesapeake-bay-collaborative#stream/0>

Appendix K

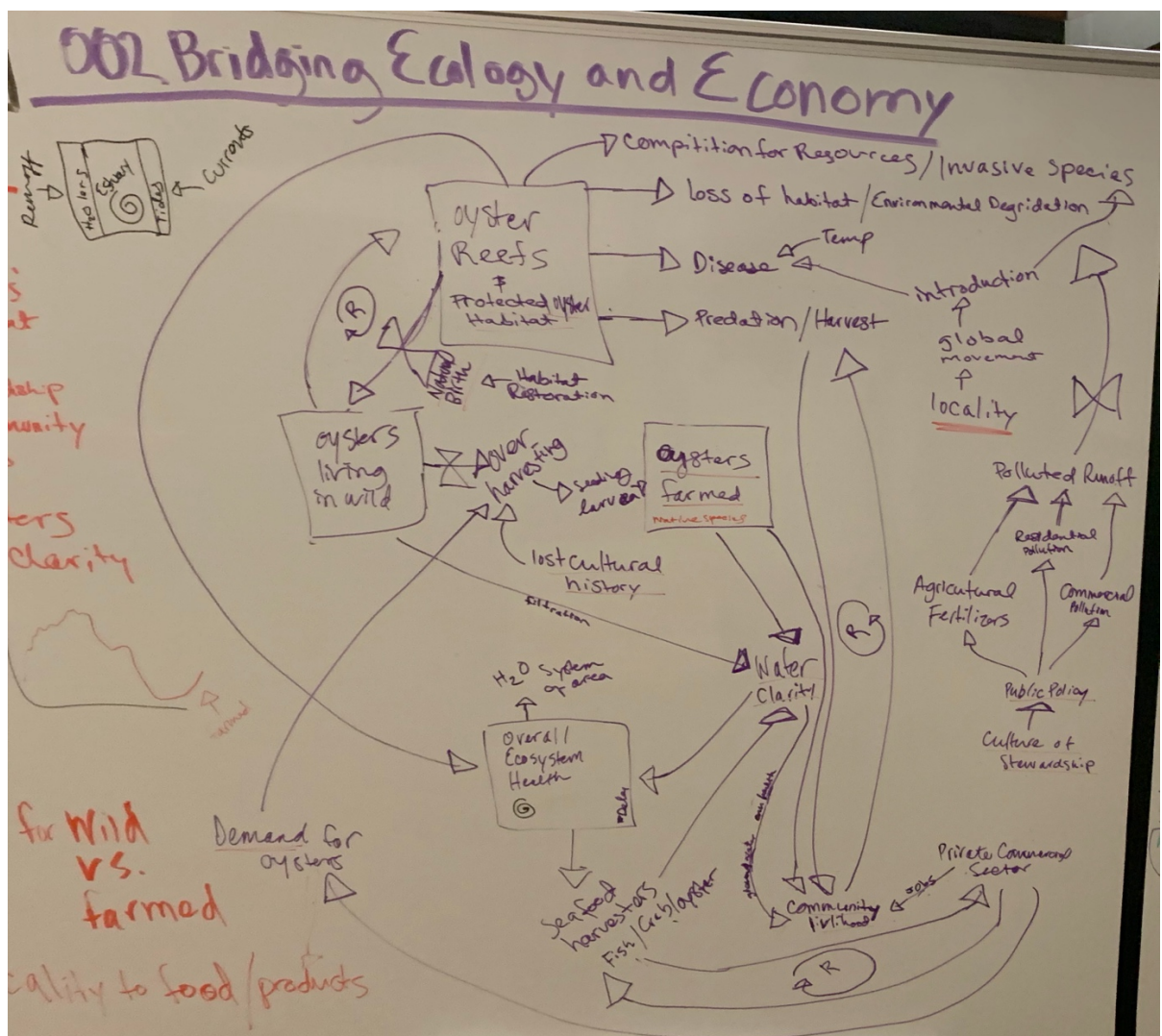
Episode 002 Systems Diagram

**Bridging Ecology and Economy**

During topic selection process, the initial systems diagram was brainstormed and with further research into variables, drivers and system outcomes, this systems diagram was developed. It shows leverage points, in red ink, and assists the podcast production team in explaining complex cause and effect relationships.

**Figure K1**

*Developing the Systems Diagram about Chesapeake Bay Oysters for Episode 002*



**Figure K2**

*Episode 002 Systems Diagram showcasing leverage points, interconnections, and reinforcing loops*

