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Youth in Restoration

Youth Engagement in Ecological Restoration

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ABSTRACT: There is a growing need to engage youth in ecological restoration in order to address rising environmental issues. Youth involvement in restoration ecology, and more specifically, participation and assistance with field-based work is beneficial for all involved parties and should, therefore, be more widespread. Here we describe different opportunities and approaches to engaging youth in restoration including programs and activities in classrooms, citizen science, formal internship programs, and opportunities through social media. We also discuss potential challenges associated with youth engagement in restoration and offer solutions. Youth engagement is critical for the development and continuance of the field of ecological restoration, and strategies to integrate young people into restoration projects should become more common in the field.

KEYWORDS: youth, engagement, ecology, restoration, outreach

CONCEPTUAL IMPLICATIONS:

- Increasing youth engagement in ecological restoration is critical to help confront current environmental issues and ensure the growth of this field.
- Low cost yet effective approaches for youth engagement are present in classrooms, internship programs, volunteer opportunities, and through the use of online tools.

Introduction

During the last few decades, increasing pressures (and subsequent degradation) occurring on ecosystems worldwide have led to a rise in the need for more effective design and application of ecological restoration (Young et al. 2005; Nilsson & Aradóttir 2013; IPCC 2021). The UN Decade on Ecosystem Restoration highlights the importance of increasing involvement with

novel stakeholders in restoration to enhance diversity of ideas in management and energize the next generation of restoration practitioners. To meet these challenges, a wide variety of skills, expertise, and backgrounds are needed. Additionally, instilling interest in restoration in youth is essential to ensure the continuance and growth of restoration ecology in research and practice.

Engaging youth in ecological restoration projects and related activities might be fundamental to setting an individual on a path towards environmentalism and activism (Miles et al. 2000; Schusler et al. 2009; Wells & Lekies 2006). However, beyond the benefit of youth exposure and involvement in revegetation projects for the field of restoration, youth engagement might also be fundamental to the health and wellbeing of children and teens. For example, research suggests that interacting with nature enhances memory and attention in young adults (Hartig et al. 2001). Even brief interactions with nature result in marked improvements in cognitive function in youth (Pyle 2002; Wells & Lekies 2006; Bell & Dymont 2008). These experiences are so critical for the development of youth that depriving young people of forming relationships with nature can have detrimental intellectual, biological, emotional, and developmental effects (Pyle 2002; Bell & Dymont 2008; Strife & Downey 2009). Here we describe general approaches to engage youth in restoration ecology. Specifically, we explore opportunities from the individual to the institutional level, describe potential materials to use in the classroom, and explore potential limitations to engaging youth in restoration. We define youth broadly and address age groups ranging from elementary school to undergraduates. We provide examples from the literature, our own region (southwestern AZ) and others, to illustrate recommendations.

Field and classroom opportunities

Youth in the field

Hands-on restoration and conservation experiences are effective methods for engaging youth. Laboring in nature can create belonging and ownership, and physical immersion may build intimacy with nature as well as combat feelings of despair about the future of the environment (Nairn 2019; Shah & Martinez 2016; Furness 2021). The ability to physically participate in restoration is thought to be a critical characteristic that gives restoration the ability to foster connectedness to nature (Higgs 2003; Furness 2021). As such, participation in restoration through working and volunteering in field crews present opportunities to actively engage youth in hands-on restoration. For example, the Arizona Conservation Corps (AZCC) engages both young adults and youth through a diverse set of experiences in service on public lands. Field crews may be involved in various projects including non-native species removal, desert restoration, tree planting, and trail maintenance. Similar opportunities are available through the Youth Conservation Corps, American Conservation Experience, Student Conservation Association, Borderlands Earth Care Youth (Arizona), Canyonlands Research Center (Colorado), and the Center for Land-Based Learning Student Landowner Education & Watershed Stewardship (California).

Relationship-based organizations focused on conducting stakeholder-driven research and providing outreach and education to stakeholder groups and local communities such as ‘Imo Pono No Ka ‘Āina (Hawai’i), Grand Canyon Trust Rising Leaders (Arizona), and Cooperative Extension (CE) offer unique opportunities for youth engagement in restoration (Gornish & Roche 2018). The Rising Star Internship program focused on promoting awareness of CE through community activities, increasing interest in employment with CE, and benefiting students through providing leadership opportunities and networking (Sellers et al. 2021). These

programs largely benefit the involved students by exposing them to a number of facets related to land management and restoration while offering opportunities for professional development.

Another promising avenue for enhancing youth engagement in restoration on public lands is through citizen science opportunities (Pitt & Schultz, 2018). Citizen science initiatives can promote robust youth engagement, build relationships with partners to foster further collaborative events, and meet other policy objectives (Pitt & Schultz, 2018). Citizen science can also support monitoring goals of multiple groups and potentially provide long-term and valuable monitoring data, thereby increasing an agency's capacity (Kountoupes & Oberhauser 2008; Ballard et al. 2017). For example, in a case study describing three Forest Service citizen science programs, youth-based citizen science projects were shown to have the potential to meet youth engagement objectives, contribute useable monitoring data to agencies, and engender interest in natural resource careers (Pitt & Schultz, 2018). To ensure the success of long-term ecological restoration and youth engagement, citizen science initiatives involving young people can amplify restoration projects and partnerships among non-profit organizations, local, state, and federal-level government agencies and universities.

Partnerships between schools and restoration related organizations

Efforts to engaging youth in restoration should be present across all ages as a desire to pursue careers in related fields often starts from a very young age (Strife & Downey 2009; Wells & Lekies 2006). To cultivate a desire to protect the environment, elementary school curriculum that includes dedicated activities and lessons to provide students with meaningful experiences with nature is paramount (Schwab & Dustin 2014; Shume 2016). Shume (2016), studied how elementary students' participation in a prairie restoration project affected their environmental

literacy. Through field trips, interviews, and observations of the site over the span of one academic year, students were found to feel an increased ease in nature, appreciation and respect for nature, awareness of ecological processes, and a sense of agency to restore nature (Shume 2016).

On college and university campuses, establishing student chapter associations of professional societies associated with ecological restoration leverages existing institutional infrastructure to increase youth involvement for relatively low cost (Wachenheim 2007; Erickson 2008). Such associations provide opportunities for students at multiple levels of engagement, from casual members who attend club meetings and events but do not actively participate in organizational duties to those who will take on leadership positions. For students pursuing a career in restoration ecology, involvement in an official student association is a tangible and well-documented experience that will increase their competitiveness as applicants for future degree programs, scholarships, jobs, and fellowships, foster valuable networking connections, and cultivate inclusion (Ansmann et al. 2014; Muijs et al. 2010, Toone et al. 2022). For example, the Society of Ecological Restoration grants free membership to all students registered in university chapters and provides increased opportunities for participation at annual conferences. Students interested in ecological restoration for non-professional reasons, or simply enjoy the outdoors and nature, can participate in events such as cultivating gardens on their campus, club hikes and camping excursions, or volunteer restoration activities with a local state or national park. Student chapter associations are largely inexpensive and easy to establish and maintain. They require a faculty sponsor and coordination with the college and society to validate the chapter and ensure compliance, and usually an annual fee paid to the society. Relevant professionals themselves can

bolster youth engagement by donating a small amount of their time to give such presentations where they might even find their next employee (e.g. Kadlowec et al. 2001).

Online and media tools

Interactive online tools demonstrate great potential for educating youth about landscape conservation, activism, and instilling a desire for involvement in related fields (Cherry 2021; McGowan & Scarlett 2021). These tools can also be easily implemented into school curricula, internships, and volunteer events. For example, iNaturalist, a web-based and mobile supported citizen science social network platform, is a widely used tool used to make observations of local flora and fauna. Observations via photographs are recorded, shared with fellow iNaturalist users, and identified. The application is free, making it an invaluable resource to include in classrooms, workshops, and internships. Additionally, observations made on the application are stored in global repositories, making them available to researchers (Aristeidou et al. 2021a; Aristeidou et al. 2021b).

Providing opportunities via social media is another excellent way to engage youth. Social media use has been shown to positively influence environmental engagement by young people (Scherman et al. 2021), in part because news of successful initiatives by youth can rapidly spread through various online channels (Napawan et al 2017; Boulianne et al. 2020). Linking restoration outreach with social media can be an inexpensive way to quickly recruit younger collaborators. For example, in September 2013, almost 3200 acres on Mount Diablo, CA were burned in the Morgan Fire. To understand plant rehabilitation post-fire, through time, a group called Nerds for Nature initiated a citizen science campaign where participants were directed to take photos of vegetation at different locations on the mountain and upload the photos with a particular hashtag

to one of several social media sources (e.g. Instagram and Twitter). Since its inception, the program has almost 2000 images, the most recent of which was added to the database in April 2022. Youth are comfortable with and adept at using social media, increasing the likelihood that restoration engagement will be successful when using this method of communication.

Film and social media are powerful tools to spread awareness about successful youth activism and environmental issues (Cherry 2021). Films, disseminated over social media, are particularly effective at eliciting positive responses as viewers are subliminally involved in metal participation with the characters and story (Niemiec & Wedding 2013). Films also help instill virtues and develop character strength in the viewer, particularly young ones (Niemiec & Wedding 2013). Given the success of these media to inspire youth to engage in activism, there is great potential to use film to educate and inspire youth about restoration ecology (Tessman & Gressley 2011). Many free or inexpensive tools are available for movie creation (e.g. Genereux & Thompson 2008) and students can be engaged to actually create movies themselves, providing novel opportunities for outreach skill development. Care should be placed to spread more media about success stories than failures. Exposure to media highlighting failures and negative outcomes related to environmental movements for both children and adults can lead to avoidance of learning more about the issues (Nairn 2019).

Challenges

We understand that limits on funds and expertise can inhibit creation and enthusiasm for restoration-based outreach efforts. These efforts, however, need not be large-scale and expensive with extensive investment in time, training, and funds (e.g. Bartlett & Bos 2018). For example, researchers and practitioners providing a guest lecture in a classroom or a webinar is a low-cost

and low-time intensive outreach activity which can be easily catered to youth. Identifying and reaching out to local groups that already do outreach activities (such as a school or community garden) can also be a way to facilitate a low-cost workshop and reach a wider audience within the community. For practitioners, adding an ‘outreach fee’ into each contract can ensure there are funds for this essential service to stakeholders within the local community. Finally, partnering with existing organizations that have already cultivated networks and experience engaging youth is an excellent way to leverage existing knowledge without having to ‘reinvent the wheel’ (Gornish et al. 2021).

Conclusion

The field of ecological restoration is evolving quickly to address changing environmental needs (Farrell et al. 2020). To face pressing challenges such as climate change, sustained engagement of a new generation of practitioners and researchers is critical for the resilience of ecological systems worldwide, while also being greatly beneficial for youth development and their wellbeing (Farrell et al. 2020, Hartig et al. 2001). It is the responsibility of those already involved in the research and practice of restoration to delight and recruit new individuals into the field. Young people are ready and able to heed the call of restoration, we just need to effectively engage them.

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