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Insect Festivals in North America: Patterns and Purposes

Introduction

Human desire to interact with and learn about wildlife extends beyond charismatic megafauna. In the past two decades, insects have carved out a niche in the ecotourism sector. Entomotourism has emerged as a growing mainstream attraction for many tourists and insect enthusiasts alike (Lemelin 2015). This subsector of ecotourism encompasses a wide range of insect-related recreational activities, such as collection, educational or multimedia entertainment, and insect encounters in controlled environments, such as butterfly pavilions or insectariums (Lemelin 2013). Tourists all over the world may engage in activities such as photography, observation, entomophagy, and other forms of direct interaction with various types of insects.

There are many explanations for this attention, including new technology (e.g., on-line chat groups and identification), the availability of digital images, and accessibility of new resources (e.g., field guides and insect organizations). Tourists are interested in insects for many reasons (Lemelin 2009). Some people love to see insects' amazing color, behaviours, and unique features. Others like to see and photograph the spectacles of large congregations of insects. Some want to see rare species or to learn new things about insects. Still others want to learn about how insects can improve or maintain human well-being, through

pollination, food, and cultural heritage (Guiney and Oberhauser 2008, Durst et al. 2010, Yi et al. 2010). Many people like to learn about how indigenous peoples gained knowledge about or used insects (Hogue 1987, Huntly et al. 2005). Some people are even intrigued by the undesirable aspects of insects, such as crop consumption and biting humans (Kellert 1993, Huntly et al. 2005, Lockwood 2013).

A particular form of insect recreation is the insect festival. More generally, festivals are events that celebrate a local phenomenon (Picard and Robinson 2006), and are called many other names such as jamborees, fairs, and carnivals. Traditionally, festivals were often accompanied by religious rituals, agricultural goods, or cultural relics, but recently festivals have taken on a new form and function (Picard and Robinson 2006). As such, festivals accomplish many goals, such as enhancing the profile of a community, improving a sense of community in the local area, generating political interest to support local development, producing local economic impacts, offering local recreational opportunities, and conserving natural and cultural features (Hvenegaard 2011, Moscardo 2007).

In particular, nature-based or wildlife festivals celebrate unique features of the natural environment. Around the world, communities offer festivals on insects, mammals, birds, fish, and insects, as well as plants, landforms, water, and the sky. There seems to be growing interest by communities in offering, and by tourists attending, such wildlife festivals (Hvenegaard 2011). Most wildlife

festivals are organized by volunteers groups, special interest organizations, or tourism agencies. Wildlife festivals are typically available to the public (Lawton and Weaver 2010) and last a short time (usually 1-7 days). Common wildlife festival activities include presentations, guided walks, children's activities, competitive events, and trade exhibitions (Hartley 2005).

Thousands of people attend events that celebrate insects in communities and society at large. This has led to research efforts, especially in the non-Western World, to understand the dynamics insect festivals such as the Hampyeon Butterfly Festival and Muju Lightning Bug Festival in Korea (Kim et al. 2008a, Kim et al. 2008b, Song and Chiang 2002). In North America, there is growing interest in insects for recreation, as a form of entertainment, community celebration, and wildlife watching. For example, thousands of people travel to the Great Smoky Mountains National Park each May and June to watch Synchronous Fireflies display (Brown 2011) and over 100,000 people participate in the annual Woollybear Festival in Vermillion, Ohio (Jeffers 2014). These examples demonstrate how popular some insects have become and how they can attract larger numbers of people.

There are just a few studies about the characteristics of insect festivals. First, Scott reports that participants at the BugFest (Cleveland, OH) were disproportionately female, white, married, 25-44 years of age, and new to the festival. Festival motivations were focused on nature appreciation, family

togetherness, and curiosity. Second, Kim et al. (2008b) describe how the annual Hampyeon Butterfly Festival (South Korea) evolved since it started in 1999 (1710 people attended in 2006), along with its economic, socio-cultural, and environmental impacts. Third, Hvenegaard et al. (2013) found 107 insect festivals around the world. Attendance ranged widely (high of >100,000 people), most originated in the past 10 years, and occur during the north hemisphere's non-winter months. Most festivals focused on all insects, but a few targeted taxonomic groups, especially butterflies and fireflies. Last, Lemelin (2007) places insect festivals in the larger context of insect tourism.

In the same way that traditional wildlife tourism seeks to facilitate positive experiences between humans and wildlife, insect tourism provides a platform on which humans can learn about and gain firsthand experience interacting with insects, often dismantling the stigma that commonly surrounds the majority of arthropods. Entomotourism attracts people for a variety of reasons. It may capitalize on or combat pervasive entomophobia, or appeal to an individual's sense of the negative sublime, feelings that ultimately translate to fascination (Lockwood 2013). In all cases, however, entomotourism works to bridge the modern disconnect between humans and insects. Despite the growing understanding of insects in a leisure context, little is known about insect festivals in particular, especially in North America. The goal of this paper is to determine the scale of the insect festival industry in North America, to describe the basic

characteristics and purposes of insect festivals, and offer strategies for managing the implications of those festivals for sustainability.

Methods

We created an inventory of active insect festivals that had occurred between July, 2014 and June, 2015 in North America by conducting a web-based search. We started with the list compiled by Hvenegaard et al. (2013), to evaluate which North American festivals continued to be active. Then we searched for new or previously missed festivals by examining festival websites, news articles, press releases, and Facebook events. We also examined wildlife, entomological, and conservation organizations, as well as environmental centers and tourism boards, for lists of additional festivals. We excluded festivals that only involved insects in the festival name or as only a small part of event activities.

We gathered information about location (by state or province), timing (which month), length (number of days), history (number of years operating), attendance (number of people), activities offered (phrases to describe), fee structure (cost per person), discounts (adjustments to fees), and the focus of the festival (type of insect emphasized). We also coded each festival by major purpose (one primary purpose, and multiple secondary purposes). We stored this information on a spreadsheet, and then analyzed the data with SPSS version 21.

Results

Characteristics

The 2015 web-based search revealed 81 active insect festivals in North America. A variety of words were used to name the festivals, including fest, jamboree, fair, insectival, and insect day (or week). Since an original search in 2011 (Hvenegaard et al. 2013), 15 had been discontinued, 2 evolved into festivals that no longer primarily focus on insects, and 2 had evolved into stationary museum exhibits that now run year round. We found history data for 72 festivals. Eighteen percent were 1-5 years old, 28% were 6-10 years old, 22% were 11-15 years old, 15% were 16-20 years old, 8% were 21-25 years old, 1% was 26-30 years old, and 7% were older than 31 years. The longest-running insect festival was the annual Woollybear Festival in Vermilion, Ohio, which started in 1972. Of the 81 festivals, 85% occur in the United States (17% in the Midwest, 24% in the West, 12% in the Northeast, and 32% in the South) and 15% occur in Canada (7% in the East, 6% in the West, and 1% which travels across the country).

All of the insect festivals recorded occur annually. These festivals take place every month of the year except January and December. Three percent of the festivals occur in February, followed by 5% in March, 10% in April, 10% in May, 10% in June, 12% in July, 19% in August, 21% in September, 9% in October, and 1% in November. One festival (1%) was offered year-round. The mean number of

days offered by the festivals was 1.5 (SD = 1.0, Range = 1-6). Seventy percent lasted 1 day, 20% for 2 days, 5% for 3 days, 3% for 4 days, and 3% for 6 days.

Attendance varied widely. Of 33 festivals reporting attendance, 15% had 100-499 people, 6% had 500-999, 42% had 1000-4999, 15% had 5000-9999, 18% had 10,000-49,999, and 3% had 100,000 or more (which was the Woollybear Festival with about 100,000 attendees). There were no festivals indicating an attendance less than 100. The festivals offered many different types of children's activities, such as crafts, face painting, puppet shows, and treasure hunts. Other activities and offerings to all age groups include guided walks, workshops, crafts, films, music, presentations, tagging, identification, pond dipping, insect cooking, demonstrations, and trade shows.

Of the 67 festivals indicating a fee structure, 49% were free to everyone, 9% were free with admission to a larger attraction (e.g., local museum or environmental center), and 41% charged some type of admission (18% were $1-5 per adult, 15% were $6-10 per adult, and 8% were $11-15 per adult). Most festivals (33%) offered a discount for children, and there were examples of other discounts for senior citizens, veterans, and members of specific environmental, museum, or entomological organizations. A few festivals even offered unique discount opportunities. For example, in the past, the Bug Fest at Ripley's Believe it or Not Museum in California has offered patrons a discount if they eat a "basic bug" and free admission if they eat a "super bug." Economic impact was

occasionally listed as an important output of the festival. Some websites indicated that the event or agency helped raise money for charity, was a fund raiser for the sponsoring agency, or supported jobs in the local area.

The focus of these insect festivals varied considerably. Some festivals targeted insects in general, while other festivals targeted one group of insect. Of the 81 festivals, 49% focused on all insects, 31% focused on butterflies, 4% on dragonflies, 4% on honeybees, 3% on caterpillars, 3% on blackflies, and 1% each on butterflies and dragonflies together, fireflies, ants, ladybugs, cockroaches, and mosquitos. About 32% of the festivals featured butterflies, with some targeting endangered species (e.g., 7% targeted the Monarch Butterfly). Such festivals raise awareness about these species through themed events, such as butterfly tagging, crafts, films, and nature walks. Additionally, some of the insect festivals capitalize on the common dislike of some insects (e.g., mosquitos, blackflies, and cockroaches), and convert that disdain into a cause for celebration. For example, the purpose of the Adamant Black Fly Festival in Vermont is "to have some serious fun celebrating the bug we love to hate" (Freeman 2010).

Purposes

For 80 festivals, we found associations with funders or sponsors. Many were museums and service groups (19%), industry (19%), nature centers (14%), parks and conservation authorities (13%), zoos and botanic gardens (11%),

municipalities (9%), and science groups (e.g., universities and colleges – 9%). These associations likely influenced the four main themes that emerged from the purposes of these insect festivals: education, entertainment, celebration, and entomophagy. Some of the festivals explicitly stated that one or more of these ideas was a purpose of the festival, while others gave more general descriptions, from which we inferred the specific purpose. In addition to these main purposes, a few festivals were also held as fundraisers for various nature centers or charities.

Education alone was the purpose for 21% of the festivals, and was mentioned in combination with one or more other purposes for another 23% of the festivals. Festivals often incorporated education by way of lectures, crafts, nature walks, and live insect demonstrations. Many of these efforts were specifically aimed at children as a way to foster appreciation for, and knowledge of, insects from a young age. Many of these festivals stressed the importance of insects in various ecosystems and for human existence. For example, The Arizona Insect Festival (Tucson, AZ) provides opportunities to "learn about the importance of insects in our lives and discover insect-based research taking place." In addition, the Palisade International Honeybee Festival (Palisade, CO) educates the public "about the world-wide crisis on colony collapse and to support a healthy honeybee population worldwide and its impact on agriculture in the Grand Valley, Colorado and the world." The educational component of many of these festivals is often tied to insect or ecosystem conservation, which is rarely explicitly stated in

the description of the festivals, but is typically implied through the variety of activities and opportunities to interact with and learn about insects provided by each festival.

Entertainment was the sole purpose for 11% of festivals, but was a joint purpose for another 70% of festivals. For example, since 1984, the Insect Fear Film Festival (Urbana-Champaign, IL) screens insect-themed thriller films, and provides opportunities to handle live bugs and eat fried bugs during intermission. The Incredible World of Bugs, a travelling exhibit in Canada, seeks to "entertain, engage, and enlighten the general public about the strange and fascinating world of butterflies and insects". The Insectival (Columbus, GA) allows visitors to "experience the world of insects through entertainment and interactive displays."

Celebration was the sole purpose for only 1% of festivals, but was a joint purpose for another 51% of festivals. For example, the intention of North Carolina's BugFest was "to celebrate creepy, crawly, six-legged creatures." The Day of Insects (Ames, IA) "brings together professionals, academics, advocates, and enthusiasts to explore and celebrate entomology."

Last, while entomophagy (the practice of eating insects) was the sole purpose for only 1% of festivals, it was a combined purpose for another 12% of festivals. The Bug Festival in Austin, TX highlights this sustainable food opportunity by hosting an annual bug feast and potluck, where a variety of insects

are cooked, restaurant style, and consumed, while topics related to entomophagy are discussed.

Discussion

Academic research on the characteristics of wildlife festivals is fairly new (e.g., see Lawton 2008, 2009; Lawton and Weaver 2010; Hvenegaard 2011). Moreover, the few studies on insect festivals in particular have focused on Asia (e.g., Kim et al. 2008a, Kim et al. 2008b, but see Hvenegaard et al. 2013). Thus, with unique human perceptions of insects in North America (Dodd 2013), this paper sought to describe the characteristics and purposes of insect festivals in North America.

First, with 81 active insect festivals in North American, and with attendance commonly in the thousands or tens of thousands, there seems to be substantial interest on behalf of the communities offering the festivals and the visitors attending the festivals. With so few studies, it is difficult to detect insect festival growth, but the number of insect festivals in North America has not changed much since 2011 (82 to 81) (Hvenegaard et al. 2013). By comparison, there were about 400 birding festivals in North America in 2014 (Bird Watcher's Digest 2016). The proportion of insect festivals between Canada and the United States has been constant since 2011 (20:80 in 2011- Hvenegaard et al. 2013 -

versus 15:85 in 2015). This makes sense since most of the festivals were in operation since 2011.

While the number of insect festivals in North America has remained steady, 18% (15 of 82) of the festivals have been discontinued, and a further 5% (4 of 82) have evolved beyond our definition of an insect festival. This turnover and change rate is supported by the high percentage (28%) of insect festivals that were 5 years old or younger. Indeed, only 9% of insect festivals were older than 20 years. On one hand, for long-running festivals, which are part of the community fabric in terms of economic impacts and volunteerism, there might be incentives to maintain ongoing operations. On the other hand, many festivals fail after a few years of being offered. Reasons for failures of past festivals include difficult weather, volunteer burnout, lack of corporate sponsorship, reliance on one financial source, poor marketing, and lack of planning (Getz 2002). This study did not determine the reasons for no longer offering an insect festival.

The lack of festivals during the winter months is consistent with the low levels of insect activity during that time and in terms of visitors being busier during those busy months. Most insect festivals take place in July, August, and September, corresponding to the highest levels of insect activity, reliable insect viewing, and visitors on vacation. As expected, most festivals lasted for just one day. This is consistent with patterns for other wildlife festivals and festivals in

general (Hvenegaard 2011). This also makes sense in terms of needing to minimize the amount of volunteer time needed to operate these festivals.

The wide variety of target groups for these insect festivals suggest diversity in insect distributions, habitats around the continent, and preferences for visitors. Almost half (49%) of the festivals focused on insects in general. This strategy likely attempts to attract a larger number of visitors who may have diverse interests in insects. The strong focus on butterflies reflects society's general interest in these colorful and charismatic micro-fauna (Smith and Sutton 2008). The focus on insect groups or species that have traditionally been viewed negatively by the public (eg. Black flies, mosquitos, and cockroaches) suggests a small, but important need to overcome those negative attitudes.

The purposes of insect festivals is aided by knowing the key sponsors or funders, which were fairly spread out among museums, service groups, industry, nature centers, parks, conservation authorities, zoos, botanic gardens, municipalities, and science groups. One way to characterize the role of insect festivals is their sole purpose. In this case, education (21%) and entertainment (11%) were much more prominent than celebration (1%) or entomophagy (1%). However, when sole and shared purposes were combined, entertainment was the most prominent (81%), followed by celebration (52%), education (46%), and entomophagy (13%). Celebration was expected to be more prominent, given that the primary purpose of community festivals is to promote public celebration (Getz

2005). Many festivals combine the purposes of celebration and entertainment in interesting, family-friendly ways, such as cockroach races, bug petting zoos, and spider feeding. Entertainment is important for marketing as it is a key motivation and factor for satisfaction for many festival visitors (Li and Vogelsong 2003). Education plays an important role, in terms of providing background for sustainability (e.g., identification, ecology, conservation of insects) and in meeting visitor motivations for learning.

Not surprisingly, entomophagy is emphasized the least, given the North American reluctance to engage in eating insects (Yen et al. 2013). Entomophagy has historically been practiced by indigenous groups all over the world, but has grown in developed countries only in recent years. The practice of eating insects has been cited by the United Nations as a potential solution to address the issue of global food security, as insects require a significantly lower energy input to produce than traditionally farmed foods, and are high in protein, vitamins, and other necessary nutrients (van Huis et al. 2013). In addition to the practical appeal of eating insects, they have come into vogue in high-end restaurants in countries where entomophagy is not a standard practice, in many cases being described as 'gourmet' (Yen et al. 2012). Insect festivals provide a venue for accessible opportunities for the public to experiment with the growing trend of entomophagy. As eating insects becomes more acceptable in Western society, the

number of festivals including entomophagy in their itinerary should continue to grow.

The analysis of purposes of the insect festivals revealed few stated commitments to insect conservation. As noted elsewhere, wildlife festivals can contribute to wildlife conservation through several mechanisms (Weaver 2002, Higginbottom and Tribe, 2004, Hvenegaard 2011). For example, insect festivals can support conservation through incentives to designate protected areas for insects, collection of citizen science data, revenue to enhance management for insects and their habitats, local support among residents for insect conservation due to the economic benefits provided in nearby communities, and increased education among visitors and local residents (Higginbottom et al. 2003). However, very few insect festivals focus on the potential conservation results from such efforts. While education was a prominent purpose for insect festivals, and supports conservation in many direct and indirect ways, the website information did not state any changes resulting from those efforts.

Hvenegaard et al. (2013) suggest strategies that insect festival organizers can undertake to promote insect conservation. First, using high profile insect species as flagship species can "arouse public interest in the animal and its habitat and promote broader ecological and economic values of conservation" (Smith and Sutton 2008: 127). The Monarch Butterfly might be a good candidate due to its migratory cycle, bright colors, and high levels of awareness.

Second, insect festivals can attract citizen scientists to monitor insect populations over time (Johansen and Auger 2013). Citizen science and monitoring projects are already underway for a variety of species or groups such as dragonflies (eg. Dragonfly Festival in Manitoba) and Monarch Butterfly Larva (Oberhauser and Prysby 2008). Third, insect festivals can help raise money to manage or protect critical insect habitat. For example, the Joseph A. Strasser Butterfly Festival in Jacksonville, FL is the only fundraiser for the city's Tree Hill Nature Center, supporting science education and animal care (Tree Hill Nature Center 2016). Fourth, some insect festivals generate substantial economic benefits in local areas (Kim et al. 2008b). The potential for conservation arises if local residents choose to protect local habitats in order to maintain long-term economic benefits. Last, the potential educational benefits are important in terms of public awareness, positive attitudes, and conservation involvement (Saunders 2004), but need further research.

Conclusion

In terms of limitations, this study should acknowledge that it difficult to determine all insect festivals in North America, due to variations in publicity. We relied primarily on website sources. In addition, among the festivals for which we could gather information, the quantity and quality of information (e.g., attendance, purposes) varied considerably, causing us to make some judgment calls about

festival purposes. Moreover, purposes implied by festival organizers may be different from motivations identified by festival visitors. Last, it is difficult to know about past insect festivals that are no longer running because they are not supplying any further information.

In terms of further research, several avenues are recommended. First, a systematic survey of organizers would provide more consistent information regarding the characteristics and purposes of the festivals than website sources. Moreover, a similar survey would provide insight into the perceived effects of insect festivals, in the areas of economic impact, learning, attitude change, behavioural change, community impressions, and more. Similarly, a systematic survey of visitors would reveal valuable information such as demographic characteristics, motivations, and benefits (Scott 1996). Given the turnover identified in festival operations, it would be helpful to understand the characteristics of successes and failures, and the factors that contribute to each (Getz 2002). Last, there are many avenues of research on festivals and events in general that could be applied or compared to insect festivals, including life cycle, visitor characteristics, use of technology (e.g., identification software), collecting species (e.g., photography), and recreation specialization.

In conclusion, insect festivals are significant in North America in terms of spatial distribution throughout the continent, temporal distribution throughout the year, high attendance at some events, and potential benefits for communities,

attendees, organizations, and insect conservation. Insect festivals can develop pride in a community, create awareness among attendees, produce local economic impacts, and generate interest in science participation (Hvenegaard et al. 2013), They also represent an important stage of transition between our past history of hostility or ambivalence (Kim et al. 2008a) to a more positive relationship that can be rooted in our culture, through economic value, ecosystem services, recreation, and tourism (Hogue 1987, Losey and Vaughan 2006). Insect festivals can also be part of a deliberate conservation strategy (Hvenegaard et al. 2013). For instance, to help conserve butterflies in Canada, Hall (2009) recommended education and awareness through activities such as wildlife and butterfly festivals. Nevertheless, for insect festivals to be effective, they must careful planned, managed, communicated, and evaluated (Millar 2003).

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