



# Promoting the Conservation of the Salt Creek Tiger Beetle Using the Visual Arts

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**M**any challenges lie ahead for humankind as we attempt to correct the environmental damage caused by human activity. Two of these challenges are tied to collective apathy towards the environment: we must instill an appreciation for nature in a society that is becoming increasingly detached from the natural world, and reverse public perceptions that biodiversity is unimportant and not worth our resources to preserve (Cardoso et al. 2012, Kremen et al. 1993, New 1999, Zamin et al. 2010). The greatest biodiversity on our planet is phylogenetically distant from ourselves and consists of species considered to be non-charismatic. Society may downplay the significance of these groups of organisms, but our existence, along with the rest of the “charismatic megafauna,” would not be possible without the presence of creatures that most people consider insignificant (Wilson 1987). For instance, the value of the services provided by insects to Americans is placed at more than \$57 billion (Losey & Vaughan

2006), and when all invertebrates are included, this figure jumps to \$33 trillion (Costana et al. 1997).

Public perception is important to the success or failure of any conservation effort. Yeffee et al. (1996) states that “public opposition is the major constraint to implementing ecosystem management plans in the United States,” and Cardoso et al. (2011) lists the issue of public perception as one of the seven impediments to invertebrate conservation. If it is true that insects and other invertebrates are not commonly perceived as worthy of protection, how can we address the challenge of a society that is seemingly uninterested in the preservation of over 99% of animal biodiversity? For example, a survey conducted by Kellert and Berry (1980) found that while 89% of respondents agreed that the bald eagle should be protected, only 25% agreed that

Fig. 1. Oil painting by Jessa Huebing-Reitinger for Salt Creek tiger beetle art exhibit. 60” x 44”.



Fig. 2. Origami by Robert Lang, commissioned by Leon Higley. Included in Salt Creek tiger beetle art exhibit. 6" long.

the Kauai wolf spider should be equally protected. An informed and involved public is instrumental in conservation efforts (Jacobson et al. 2007, Schlesinger 2010). Consequently, although it is difficult to shift societal values, such a shift regarding conservation is essential if we are to avoid irreversible environmental damage.

Because emotions play a central role in the human decision-making process (Jacobson et al. 2007) and the goal of the arts is to tie into our emotions, it is no surprise that groups involved with conservation movements have begun to implement art in their education programs. Curtis (2003) notes that the arts are commonly at the forefront of challenging dominant paradigms and that artists are often active participants in attempts to change society. Arts Council England (2002) stated that the arts "have the power to transform lives and communities. The arts have a long tradition of being used to foster certain ideologies throughout history." Pelowski and Akiba (2011) stated, "It is this phenomenon—whereby we see something new, question our conceptions and transform our world view—that

Fig. 3. Watercolor by John Cody. Included in the Salt Creek tiger beetle art exhibit. 10.75" x 7.5".



provides art's ontological and social definition." As long as civilization has existed, humankind has represented nature through the arts. Indeed, the first symbols used by humans were representations of animals (Bataille 1980, Berger 1980, Wilson 2012).

One focus of our (TRB and LGH) research has been invertebrate conservation, particularly insects in the eastern saline wetlands of Nebraska. Here, the Salt Creek tiger beetle, *Cicindela nevadica lincolniensis*, is a classic indicator species: as habitat reduction and degradation occurred through the 1900s, the Salt Creek tiger beetle moved from being widely dispersed and abundant to localized and endangered. It is a diurnal predator that actively seeks out its prey on the salt flats of the saline wetlands of Lancaster County, located in southeastern Nebraska. These salt flats occur only in Lancaster County, Nebraska, in or near the city of Lincoln. Today, less than 1% of these wetlands remain, making them one of the rarest ecosystems in the world.

Populations of Salt Creek tiger beetle have been monitored since 1991 (Spomer and Higley 1993, Allgeir 2005). Visual counts of adult beetles have fluctuated over the last 20 years, but it is clear that the numbers are dangerously low. The diminishing population of the Salt Creek tiger beetle is directly tied to habitat loss as the city of Lincoln encroaches on the last pockets of its habitat. We have been involved in research, rearing, and recovery planning for the beetle, which has received state and federal listing as endangered over the past 10 years.

As with other invertebrates, public perception of the Salt Creek tiger beetle has been largely negative. The small amount of land that has been protected as part of the beetle conservation plan can no longer be developed. This has angered land owners and developers because the land is considered to be a prime spot for development. In her book *Hope for Animals and Their World*, Jane Goodall (2009) observed, in reference to the Salt Creek tiger beetle, "of course, there can be no question of the importance of protecting an ecosystem and preventing the loss of biodiversity. Yet, there are millions of people who simply 'don't get it.' Especially if the species concerned is an insect—'Just a bug!'" She also notes that "while many [*Lincoln Journal Star*] readers welcomed the decision, many others were shocked and horrified; some, too, were genuinely mystified."

We have been involved in many public education efforts (primarily directed at elementary school students) about the Salt Creek tiger beetle and environmental conservation. These students have been responsive and excited about having an endangered species almost literally in their backyards. We developed and curated an art exhibit featuring the Salt Creek tiger beetle and its native habitat to seek a larger audience and to explore the use of art in environmental education. The Nebraska Environmental Trust, the Hayden Art Center, Pioneers Park Nature Center, the Insect Ecology Project of UNL, Nebraska Game and Parks, the U.S. Fish and Wildlife Service, the Great Plains Chapter of the Guild of Natural Scientific Illustrators



(GNSI), the Saline Wetland Partnership, and the Xerces Society (Society for Invertebrate Conservation), were all involved in the creation and support of this exhibit. Because the impact of art on social acceptance of insects is relatively unknown, we saw this as an opportunity to explore how effective this sort of event could be in changing public perception.

### Methods and Materials

An art exhibit featuring the Salt Creek tiger beetle, comprised of works from 15 local artists and nine artists from outside the state of Nebraska, was held at the Haydon Art Center in downtown Lincoln, Nebraska, during July 2009. Artists were asked to participate based on their interest in conservation, their talent, and the diversity of their media. Artwork included origami, fabric art, sculpture, oil paints, watercolor, and photography. Artists were encouraged to include a personal artist's statement reflecting their thoughts on the Salt Creek tiger beetle and conservation of the local wetland.

Opening and closing receptions with the artists were another aspect of the exhibition promotion. The opening reception was held on 10 July 2009 in conjunction with the city of Lincoln's First Friday art walk, during which most of the city's 15 art galleries were open. Volunteers at the Haydon Art Center recorded the number of individuals that attended the exhibit on a daily basis and encouraged individuals to sign the guestbook. An art catalog (funded by grants from the Nebraska Environmental Trust and Nebraska Game and Parks) accompanied the exhibit; it included full-color images of the artwork, the artists' statements, and informative essays about the Salt Creek tiger beetle and insect conservation.

A voluntary survey was also conducted. The survey collected basic demographic information such as age, gender, occupation, and hometown, along with the classification of student, academic, and non-academic adult. The survey also asked participants to rate their responses to four statements based on a nine-point Likert-type scale. Responses were classified as "before attending this exhibit" and "after attending this exhibit." Likert scales are not perfect, but they are considered to be an acceptable method of self-assessment (Maurer and Pierce 1998). We chose four simple statements so as not to overwhelm those attending the exhibit:

Before/after attending this exhibit,

- you had adequate knowledge about Lancaster County's saline wetlands and the Salt Creek tiger beetle
- you considered insects to be beautiful
- you considered insects to be economically and environmentally important
- you were aware of critically endangered habitats located in Nebraska

Data from the surveys were categorized by subject group and analyzed within each group. Statistical analysis was by one-tail, paired t-test (response for before- and



Fig. 4. Salt Creek tiger beetle by Christopher Cockburn. Linoleum block print; 12" x 12".

after-exhibit attitudes). We used a one-tail test based on the expectation that the exhibit couldn't make respondents less informed about conservation issues.

### Results and Discussion

The wide range of the artists' backgrounds provided for a very interesting and dynamic exhibit. Several works by artists outside of the Lincoln area drawn to the plight of the Salt Creek tiger beetle were included. These included "Teri" the Salt Creek tiger beetle by Jessa Huebing-Reitingner (Fig. 1) and an original origami Salt Creek tiger beetle by Dr. Robert Lang (Fig. 2), a world-renowned origami artist who was featured in the 19 February 2007 issue of *The New Yorker*. In the article by Susan Orlean, Lang expresses that his "favorite commission was to fold an endangered Salt Creek tiger beetle for an entomologist who collects Salt Creek tiger beetle art. 'For me, that commission was like manna from Heaven,' he said. 'I'll never be done with bugs.'" Other works among the diverse contributions included pieces from well-known, invertebrate-loving artists such as John Cody (Fig. 3), Christopher Cockburn (Fig. 4), and Paul Pitsker (Fig. 5).

A total of 72 surveys were completed, representing approximately 13% of total attendees. A t-test was performed to evaluate the statistical significance of changes in perceptions (Table 1). According to the survey, subjects were affected positively by the exhibit, with an average point change in their attitudes of 1.3 points on the Likert scale. When split into categories, academics changed the least (0.7), followed by students (1.1) and then adult non-academics (1.4). The academic category saw no significant change in any of the four statements in the survey (Table 1). It is not surprising that the

academics, who were primarily from a biology-related field, already had prior knowledge of the Salt Creek tiger beetle and a positive view of insects. Academics also had a more positive overall score than the other categories, with an overall average score of 7.8 (adult non-academics = 6.5; students = 6.6). Most of the students were from Lincoln, so they may have been exposed to the Salt Creek tiger beetle in the classroom setting.

The largest changes were observed in the adult non-academic group. These individuals are not necessarily exposed to ideas about the environment or the value of all organisms on a regular basis. The largest changes were seen in responses to the statement “you had adequate knowledge about Lancaster County’s saline wetland and the Salt Creek tiger beetle” (+2.4), followed by the statement “you were aware of critically endangered habitats in Nebraska” (+1.6). This result of the exhibit is encouraging; this increased knowledge and awareness of the Salt Creek tiger beetle and associated wetlands could be the result of participants being inspired to read information provided at the exhibit.

Respondents were encouraged to include comments on the exhibit as part of the survey. Here are several responses:

“It is neat to see art from biologists.”

“The Salt Creek tiger beetle was at the heart of our class: marine scientist in NE, loved the display!”

“An outstanding exhibition—so many pieces with such strength and compelling beauty. Thank you”

“Wow! Who knew?!”

“Really weird in a good way.”

“This is a truly beautiful and inspiring display! I have never so convincingly seen artists as advocates for causes and ideas—more as expressions of impressions and experiences...a very flattering demonstration of their skill and effectiveness in this regard. So glad I made the trip down to see it for myself.”

“Beautifully and thoughtfully illustrated. Take these to the schools!”

“This was a great exhibit, especially in the summer where tourism brings more people to possibly see it. We need to protect our endangered species. You never know, we might become one someday. God created all life for a purpose and we shouldn’t nonchalantly let any of it become extinct.”

Overall, in terms of producing art that evoked emotional responses from visitors, this event was very successful. As an educational activity, the exhibit helped to inform the public about the status of the Salt Creek tiger beetle in a new and innovative way. Also, many organizations worked together for the first time on a conservation project, and the benefits of this exhibit will ideally extend into the future as collaborations

**Table 1. Analysis of survey responses for all respondents and by individual respondent categories (students, non-academics, academics). Statistical analyses were by one-tail, paired t-test (response for before and after exhibit attitudes).**

		t-Test: Paired Two Sample for Means							
		“Wetland Knowledge”		“Insects are beautiful”		“Insects are important”		“Awareness of ecosystem”	
		Before	After	Before	After	Before	After	Before	After
ALL INDIVIDUALS SURVEYED	Mean	5.11	7.22	7.16	7.76	7.58	8.35	6.67	8.08
	Variance	6.84	2.80	3.48	3.56	3.63	1.61	4.73	1.57
	df	73		73		71		71	
	t Stat	-8.9585239		-4.7169238		-4.7361175		-6.5178525	
	P(T<=t)	>0.001		>0.001		>0.001		>0.001	
ACADEMIC	Mean	6.50	7.50	8.83	9.00	8.83	8.83	6.83	8.33
	Variance	10.30	3.90	0.17	0.00	0.17	0.17	7.37	1.47
	df	5		5		5		5	
	t Stat	-1.2247449		-1		NS		-1.5666989	
	P(T<=t)	0.138		0.182		NS		0.089	
ADULT NON-ACADEMIC	Mean	4.85	7.13	7.28	7.91	7.49	8.34	6.51	7.98
	Variance	6.86	2.73	3.21	2.86	3.60	1.54	5.10	1.52
	df	52		52		52		52	
	t Stat	-7.9592279		-5.0167719		-4.1969735		-5.5016958	
	P(T<=t)	>0.001		>0.001		>0.001		>0.001	
STUDENTS	Mean	5.77	7.46	6.08	7.00	7.38	8.15	7.23	8.38
	Variance	5.36	2.77	4.24	5.83	4.92	2.64	2.36	1.92
	df	12		12		12		12	
	t Stat	-4.2470304		-2.2219682		-2.3791548		-3.6380344	
	P(T<=t)	>0.001		0.023		0.017		0.002	

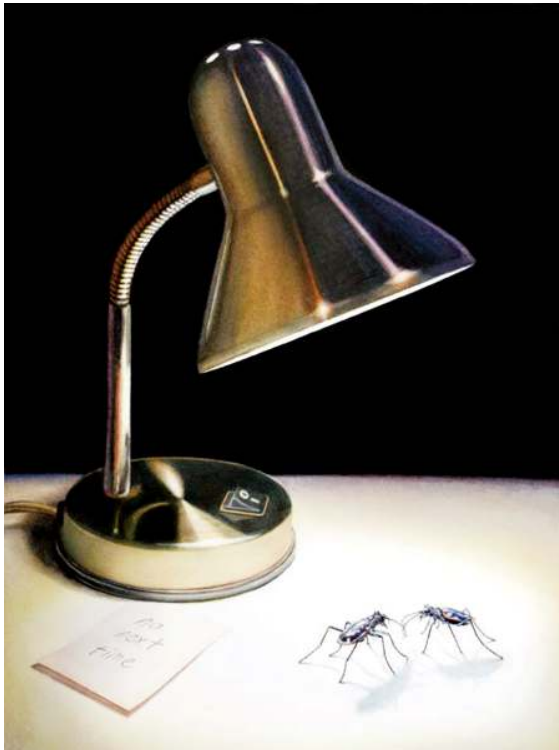


Fig. 5. *Spotted* by Paul Pitsker. Watercolor; 15" x 20".

expand among all of the groups involved. Our (admittedly limited) survey feedback supports the notion that such an exhibit can increase public knowledge of conservation concerns, including endangered insects. Perhaps a more important observation we can draw from this activity (based on individual reactions to art in the exhibit) is that depictions of insects need not be limited to symbols of alienation (e.g., Kafka 1915, Pearson 1996), but can also serve as symbols of beauty that merits preservation.

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