

# Status review of Belding's Yellowthroat *Geothlypis beldingi*, and implications for its conservation

RICHARD A. ERICKSON, ROBERT A. HAMILTON and STEVEN G. MLODINOW

## Summary

Belding's Yellowthroat (*Geothlypis beldingi*) inhabits freshwater marshes the length of the state of Baja California Sur. A gap in occurrence from approximately 25°50'N to 24°50'N separates the subspecies *goldmani* to the north from *beldingi* to the south. According to BirdLife International's (2000, 2007) population estimates, the most important sites for the species are San Ignacio (537–648 birds) and La Purísima (203–450) in the north and San José del Cabo (219–480) and Punta San Pedro (70) in the south. Half of 12 presumed breeding sites in the north and five of 14 in the south were discovered within the last ten years. The species apparently no longer occurs at one historical site in the south. Since 2000, two records from Guerrero Negro and one from Bahía Tortugas approximately 140 km and > 200 km respectively northwest of the known breeding range demonstrate the species' dispersal ability. Belding's Yellowthroat is of utmost conservation concern, but the most recent conservation summaries exaggerated the species' plight, in particular by under-appreciating the bird's capacity for long-range dispersal and the ability of marsh habitat to regenerate quickly. Formal studies of the species should be undertaken and marsh creation should be incorporated in the state's development plans. Previous calls for reintroduction efforts should not be heeded, at least for the time being.

## Introduction

Belding's Yellowthroat (*Geothlypis beldingi*) is endemic to the southern half of the Baja California Peninsula, i.e., the Mexican state of Baja California Sur. It is resident in the freshwater marshes that are scattered widely across that arid landscape. The species is considered endangered by the Mexican government (SEMARNAT 2002) and 'Critically Endangered' by BirdLife International (2000, 2007). In 2007, Belding's Yellowthroat was one of four 'flagship' species identified by the British Birdwatching Fair's organizers for funding under the BirdLife programme *Preventing Extinctions: Saving the World's Critically Endangered Birds*. The species' natural history was addressed by Bent (1953) and Rodríguez-Estrella *et al.* (1997, 1999). Guzmán Poo (2004) also discussed habitat characteristics.

We examined all relevant literature on Belding's Yellowthroat and reviewed our own field observations of the species over the last 15 years and those of others submitted since 2000 through the *North American Birds* regional reporting system overseen by R. A. E. (Observations submitted for possible use in the journal's quarterly reports are rarely based on trapping studies or systematic surveys, but are nevertheless invaluable, especially for areas visited repeatedly by birders over the years, such as many of the wetlands occupied by Belding's Yellowthroat.) We have used this information to summarize the state of knowledge of the species over the past 80 years, correcting certain published reports and making recommendations for the conservation of the species.

## Historical Overview

### *Pre-1988 Understanding*

Belding's Yellowthroat was known from 11 localities when Grinnell (1928) published his classic summation of the avifauna of the Baja California Peninsula (Table 1). Two subspecies were recognized, *G. b. goldmani* north of 26°N and *G. b. beldingi* from about 24° south (Figure 1). Although the subspecies were questioned by Behle (1950), they have generally been accepted by others (e.g., AOU 1957, Miller *et al.* 1957, Dunn and Garrett 1997). An early report of Belding's Yellowthroat from La Paz (Belding 1883, in Ridgway 1902) has generally not been listed by subsequent authors. Bancroft (1930) soon contributed nesting information from two additional locations in the northern portion of the species' range, but otherwise no new distributional information had come to light by the time of the next summary of peninsular bird distribution (Wilbur 1987).

### *Late 1980s and 1990s Investigations*

Belding's Yellowthroat enjoyed a surge of attention at the end of the last century. Within the range of *G. b. goldmani*, populations were found at San José de Magdalena (Erickson *et al.* 2001) and Mulegé (Howell and Webb 1992), and one bird was seen at San Javier (Unitt 2001). Farther south, the species was first found at San Bartolo in January 1988 (Erickson *et al.* 2001) and at San Pedro de la Presa in July 1996 (Rodríguez-Estrella *et al.* 1999). Important studies were conducted by Escalante Pliego (1991) and Rodríguez-Estrella *et al.* (1997, 1999, 2004, 2005). The latter were especially helpful in focusing on the value of freshwater habitats in Baja California Sur and their conservation. Rodríguez-Estrella *et al.* (1999) described Belding's Yellowthroat's habitat, discussed multiple threats to it, and provided quantitative banding and census data for five occupied sites.

Misinformation was also reported during this period, particularly concerning the southern subspecies. Curson *et al.* (1994) reported that "all populations are now reduced, southern ones drastically" and that the population of *G. b. beldingi* "has crashed recently owing to habitat loss, and it is presently known from just one small marsh (less than 0.1 km<sup>2</sup> in extent) near the town of San José..." They were perhaps misled in part by Escalante Pliego (1991, repeated in 2000), who made the same claim concerning the population at San José del Cabo. Dunn and Garrett (1997) corrected this misconception but failed to acknowledge the long-known population in the Todos Santos area, instead reporting that the species was "unrecorded from the west coast of the peninsula." Rodríguez-Estrella *et al.* (1999) suggested that Belding's Yellowthroat was extirpated from Santiago and underestimated the species' ability to disperse. Curson *et al.* (1994) had also labeled the species "sedentary."

In what must be considered the most authoritative summary, BirdLife International (2000, 2007) cited Curson *et al.* (1994), Howell (1999), and Rodríguez-Estrella *et al.* (1999) in elevating the status of Belding's Yellowthroat from 'Vulnerable' (IUCN 1996) to 'Critically Endangered'. Concerning Estero San José, Howell had reported that "The reeds that formerly bordered the near side of the lagoon (and supported a good population of Belding's Yellowthroats) have all but been cleared" and "There also used to be reed beds (with Belding's Yellowthroat) along the lagoon shore behind the beach east of the hotel, but in 1998 this area was denuded also." Unfortunately, BirdLife International then stated that "The population at San José has been almost certainly extirpated by the adjacent Hotel Presidente, which has removed all suitable habitat." But we have found Belding's Yellowthroats at this marsh consistently since 2001 and in 2006 the Estero San José offered excellent habitat as evidenced by a count of 85 Belding's Yellowthroats on 23 May (M. J. Iliff, M. J. Billings, R. A. E., pers. obs.), the highest single-day tally for any location that we are aware of. To what extent the bad press or management efforts mentioned by Escalante Pliego (2000) were responsible for this turn of events, we do not know.

Table 1. Summary of Belding's Yellowthroat reports through time. Localities in boldface are assumed to be breeding localities, at least at one time. Adjacent localities that might be regarded as one are shaded. Abundance indices represent the sum of banding (captures/net/day) and survey (individuals/hour) data for the best season sampled by Rodríguez-Estrella *et al.* (1999).

presumed <i>G.b. goldmani</i> localities	Grinnell 1928	Wilbur 1987	Rodríguez-E. et al. 1999	Birdlife International 2000, 2007	Erickson et al. 2001	Cody and Velarde 2002	NAB reports 2000–2006
Bahía Tortugas Guerrero Negro							imm. male Oct 2005 ad. male Dec 2000 ad. male Feb 2005
<b>San Ignacio</b>	resident	resident	abundance index 3.29	537–648 birds	resident		max. 15 in Jul 2005, incl. several juveniles
<b>San Joaquín</b>		nesting spring 1928 (Bancroft 1930)					
<b>El Mesquital</b>							ad. male Oct 2000
<b>Santa Agueda</b>		nesting spring 1928 (Bancroft 1930)					
<b>Rancho El Sauzal</b>							2 in Feb 2004
<b>San José de Magdalena</b>					up to eight Oct 1997		
<b>Mulegé</b>			10+ pairs nesting (Howell & Webb 1992); common (Whitmore & Whitmore 1997)	resident	resident		maxima: 3 in Oct 2001, 3 in Oct 2003
<b>Cadejé</b>							pair in Oct 2001
<b>La Purísima</b>	resident		abundance index 4.7	203–450 birds	resident		present in Feb 2003, 15 in Mar 2007
<b>San Isidro</b>							
<b>Comondú</b>	resident	resident	resident	resident	resident		present in Feb 2003
<b>San Javier</b>					singing male in Apr 1995 (Unitt 2001)		

Table 1. Continued.

presumed <i>G.b. goldmani</i> localities	Grinnell 1928	Wilbur 1987	Rodriguez-E. et al. 1999	Birdlife International 2000, 2007	Erickson et al. 2001	Cody and Velarde 2002	NAB reports 2000–2006
Isla San José						recorded	
<b>San Pedro de la Presa</b>			abundance index 0.5	resident	x		
<b>Segunda Bosque</b>							2 in Aug 2006
Chametla							1 in Oct 2005
<b>Lagunas de Chametla</b>							up to 2, Oct–Apr, 2002–2007
<b>La Paz</b>	[x Ridgway 1902]				pair in Apr 1995		
<b>Todos Santos</b>	resident	resident			x		max. 30 in Oct 2006
<b>Punta San Pedro</b>			abundance index 5.5	70 birds	x		max. 6 in Mar 2002
<b>Playa los Cerritos</b>							3 in Oct 2006
<b>Plutarco Elías Calles</b>							up to 2, Sep–Oct, 2005–2006
<b>Cabo San Lucas</b>							4, nesting May 2006; 5 in Mar 2007
<b>El Triunfo</b>	3 pairs (Brewster 1902)		extirpated	extirpated			
San Bartolo			absent		4 in Jan 1988		1 in Jan 2003
<b>Las Cuevas</b>	x “Eureka”						up to 3, Oct–Mar, 2004–2007
<b>Santiago</b>	very common (Brewster 1902)		extirpated	extirpated			max. 21 in Jan 2004, 20 in May 2006
<b>Agua Caliente</b>	pair nesting (Brewster 1902)						male in Sep 2006

Table 1. Continued.

presumed <i>G.b. goldmani</i> localities	Grinnell 1928	Wilbur 1987	Rodriguez-E. et al. 1999	Birdlife International 2000, 2007	Erickson et al. 2001	Cody and Velarde 2002	NAB reports 2000–2006
<b>Miraflores</b>	common (Brewster 1902)		extirpated	extirpated			up to 2, Sep–Jan, 2002–2007; singing male in Jul 2007
<b>Caduaño</b>							up to 2, Oct–Feb, 2003–2007; singing male in Jul 2006
Santa Anita <b>San José del Cabo</b>	one of the most abundant birds (Brewster 1902); one vagrant <i>goldmani</i>	resident	abundance index 5.5	219–480 birds, but “almost certainly extirpated”	resident		male in Jan 2006 max. 85 in May 2006

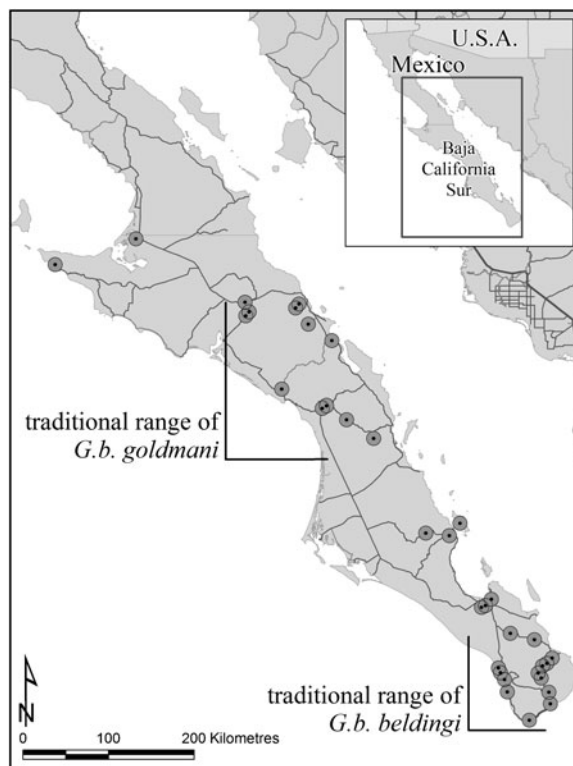


Figure 1. Distribution of Belding's Yellowthroat in Baja California Sur, showing the traditional ranges of the two subspecies; we are unaware of any specimens from the intervening area. Not all localities may support breeding populations. For example, three vagrant records are responsible for the two northwestern localities.

BirdLife International (2000, 2007) recognized only the seven occupied sites mapped by Rodríguez-Estrella *et al.* (1999), estimated a total range of slightly less than 10 km<sup>2</sup>, and posited a declining population of 1,000–2,499 birds. Although we cannot attest to the accuracy of population estimates that they provided for several sites (cf. Table 1), we applaud just about any effort to quantify this bird's populations. We believe that they underestimated the species' dispersal ability by emphasizing that "isolated and disjunct populations are vulnerable to stochastic events."

## 2000 to 2007

### *Distribution*

Beginning in 2000, reports from numerous observers on the Baja California Peninsula have been archived through the regional reporting system sponsored by the journal *North American Birds*, and many have been published there. These reports established that Belding's Yellowthroat is not extirpated at Santiago (maxima of 21 birds 19 January 2004 and 20 birds 21 May 2006, both incomplete surveys) or perhaps Miraflores (up to two generally out-of-habitat 1998–2007); revealed potential additional populations at four locations in the north (El Mesquital, Cadejé, San Isidro, and Rancho El Sauzal) and eight in the south (Segunda Bosque, Chametla, Lagunas de Chametla, Playa los Cerritos, Plutarco Elías Calles, Cabo San Lucas, Caduaño, and Santa

Anita); and included three extralimital records well to the northwest of the known breeding range (two from Guerrero Negro and one from Bahía Tortugas).

Depending on how localities are defined (cf. Table 1), Belding's Yellowthroat has now been reported from up to 12 localities, plus two extralimital sites, in the presumed range of *G. b. goldmani* (north of  $\sim 26^{\circ}\text{N}$ ) and 20 localities in the presumed range of *G. b. beldingi* (south of  $\sim 25^{\circ}\text{N}$ ). We acknowledge that some of these locations may not represent breeding sites, but rather dispersal sites. We are further encouraged by the observation by Rodríguez-Estrella *et al.* (1999) that a number of unsurveyed oases exist in the Sierra de la Giganta (between the presumed ranges of the two subspecies) that are similar to San Pedro de la Presa, where those authors discovered a population (note also the 2006 discovery of two birds at Segunda Bosque). They also pointed out the largely unsurveyed 30 km corridor of potential habitat in the La Purísima canyon. El Triunfo is the only locality previously known to have been occupied where the species has not been found in recent years.

### Dispersal Ability

A report of *G. b. goldmani* roughly 400 km out of range at San José del Cabo (Oberholser 1917) would represent the species' most far flung record of vagrancy, but we suspect that individual variation is a more likely explanation (cf. Behle 1950; S. G. M. and J. E. Pike pers. obs.). Whatever the case, we note that habitat for this species has long been dynamic and disjunct, involving many small patches of emergent marsh that can both develop and disappear quickly, factors that must select for the ability to disperse in order to locate and colonize an ever shifting array of suitable nesting locations. The recent records in northwestern Baja California Sur (in the case of Bahía Tortugas, tens of kilometers from the nearest freshwater marsh of any sort) support this hypothesis as do recent out-of-habitat records from the southern Cape District, most of which were during September and October (e.g., at San Bartolo, Chametla, Agua Caliente, Miraflores; S. G. M., pers. obs.).

### Recommendations

Although we now recognize nearly three times as many occupied sites as did Grinnell (1928) or even Rodríguez-Estrella *et al.* (1999), we have no reason to believe that either the species' range or the number of established populations have increased. Indeed, we share the deep concern for this species expressed by others and reflected in its threatened status. Considering the information presented here, however, we do believe that re-evaluation of BirdLife International's categorization as 'Critically Endangered' is warranted.

Rodríguez-Estrella *et al.* (1999) and BirdLife International (2000, 2007) offered a number of useful suggestions on this bird's behalf. We agree that ongoing monitoring of all populations, including actual censusing, should be undertaken. Likewise, excessive disturbance should be controlled at all occupied sites, with the consideration that Belding's Yellowthroats probably thrive in relatively early successional habitats, in which case periodic disturbance of vegetation could be in the species' best interest. Also, it is possible in some cases that human damming of waterways (e.g., along the Río La Purísima) allows for the formation of marshy habitat useful for this species (R. E. Webster pers. comm.). Legal protection of at least some sites should be obtained, but we believe it is important to find ways for wildlife and humans to share Baja California Sur's limited water supply. We note the coexistence of active agriculture and Belding's Yellowthroats at many sites.

Because we believe Rodríguez-Estrella *et al.* (1999) and BirdLife International (2000, 2007) underestimated the species' dispersal ability, we do not agree with their calls for reintroduction efforts at this time. Habitat restoration may be warranted at some sites, but there is probably considerably more potential for habitat creation associated with golf course and resort

development. Such habitat creation should be encouraged at what otherwise might be less productive open bodies of water. Note that the species was found at Cabo San Lucas for the first time in May 2006, in a marsh that appeared to have been newly established in the heart of the hotel district.

The following more specific research recommendations assume an unlimited budget.

- 1) Standardized survey techniques should be employed to survey all potential nesting habitat in Baja California Sur and adjacent southeastern Baja California. Satellite images should aid in the search for potential new locations for the species. Potential threats, and beneficial activities, should be identified for each location.
- 2) Once all occupied sites have been identified, a thorough census of each site should be conducted in order to ascertain the current population. To identify local and regional trends, complete censusing should reoccur at regular intervals and should include those sites previously unoccupied but appearing most suitable for the species. Counts of singing males during the spring breeding season will be the most efficient way of censusing the population.
- 3) A formal dispersal study should be conducted in order to design long-term management actions for the Belding's Yellowthroat metapopulation system. A mark-recapture study should be done at a representative sample of sites separated by different distances to obtain natal and breeding dispersal rates and distances. Short of this, indirect estimates based, for example, on acoustic marking (e.g., Laiolo and Tella 2007) could be helpful.
- 4) Genetic studies should be undertaken to address questions concerning such issues as the validity of recognizing two subspecies or the genetic and thus conservation consequences of population patchiness and potential bottlenecks.

## Acknowledgments

Many observers contributed records through the *North American Birds* regional reporting system, especially Mark J. Billings, Kimball L. Garrett, Marshall J. Iliff, and James E. Pike. Billings, Roberto Carmona, Héctor Gómez de Silva, and Eduardo Palacios provided unpublished data or helped track down unpublished information. Peter J. Pang and Zachary A. Henderson prepared the map. Paola Laiolo, José L. Tella, Richard E. Webster, and an anonymous reviewer provided helpful comments on a draft of this paper; Webster's were especially thought-provoking.

## References

- AOU (1957) *Check-list of North American birds*. Fifth edition. Baltimore, Maryland: American Ornithologists' Union.
- Bancroft, G. (1930) The breeding birds of central Lower California. *Condor* 32: 20–49.
- Behle, W. H. (1950) Clines in the yellowthroats of western North America. *Condor* 52: 193–219.
- Belding, L. (1883) Catalogue of a collection of birds made near the southern extremity of the peninsula of Lower California. *Proc. U. S. Natl. Mus.* 5: 532–550.
- Bent, A. C. (1953) Life histories of North American wood warblers. *Bull. U. S. Natl. Mus.* 203.
- BirdLife International (2000) *Threatened birds of the world*. Barcelona: Lynx Edicions.
- BirdLife International (2007) Species fact-sheet: *Geothlypis beldingi*. Downloaded from <http://www.birdlife.org> on 25 November 2007.
- Brewster, W. (1902) Birds of the Cape region of Lower California. *Bull. Mus. Comp. Zool.* 41: 1–241.
- Cody, M. L. and Velarde, E. (2002) Land birds. Pp. 271–312 plus appendices in T. J. Case, M. L. Cody and E. Ezcurra, eds. *A new island biogeography of the Sea of Cortés*. Oxford: Oxford University Press.



- Curson, J., Quinn, D. and Beadle, D. (1994) *Warblers of the Americas*. Boston: Houghton Mifflin.
- Dunn, J. and Garrett, K. (1997) *A field guide to warblers of North America*. Boston: Houghton Mifflin.
- Erickson, R. A., Hamilton, R. A. and Howell, S. N. G. (2001) New information on migrant birds in northern and central portions of the Baja California Peninsula, including species new to Mexico. *Monogr. Field Ornithol.* 3: 112–170.
- Escalante Pliego, P. (1991) Phylogenetic relations of *Geothlypis* (Aves: Parulidae). Ph.D. dissertation. City University of New York.
- Escalante Pliego, P. (2000) *Geothlypis beldingi beldingi* Ridgway, 1883, Mascarita peninsular. Pp. 304–305 in G. Ceballos and L. Márquez Valdelamar, eds. *Las aves de México en peligro de extinción*. México, D.F.: Comisión Nacional para el Conocimiento y Uso de la Biodiversidad.
- Grinnell, J. (1928) A distributional summation of the ornithology of Lower California. *Univ. of Calif. Publ. Zool.* 32: 1–300.
- Guzmán Poo, J. R. (2004) Aves del Estero de San José, San José del Cabo, B.C.S. Pp. 17–51 in R. Rodríguez-Estrella, M. Cariño Olvera and C. F. Aceves García, compilers. *Reunión de análisis de los oasis de Baja California Sur: importancia y conservación*. La Paz, Baja California Sur, Mexico: Centro de Investigaciones Biológicas del Noroeste.
- Howell, S. N. G. (1999) *Where to watch birds in Mexico*. London: Christopher Helm.
- Howell, S. N. G. and Webb, S. (1992) Noteworthy bird observations from Baja California, Mexico. *West. Birds* 23: 153–163.
- IUCN (1996) *IUCN Red List of threatened animals*. Gland, Switzerland: International Union for the Conservation of Nature and Natural Resources.
- Laiolo, P. and Tella, J. L. (2007) Erosion of animal cultures in fragmented landscapes. *Front. Ecol. and Environ.* 5: 68–72.
- Miller, A. H., Friedmann, H., Griscom, L. and Moore, R. T. (1957) Distributional checklist of the birds of Mexico, part II. *Pac. Coast Avif.* 33: 1–436.
- Oberholser, H. C. (1917) A new subspecies of *Geothlypis beldingi*. *Condor* 19: 182–184.
- Ridgway, R. (1902) The birds of North and Middle America, part II. *Bull. U. S. Natl. Mus.* 50
- Rodríguez-Estrella, R., Blázquez, M. C. and Lobato, G. J. M. (2005) Avian communities of arroyos and desert oases in Baja California Sur: implications for conservation. Pp. 334–354 in J.-L. E. Cartron, G. Ceballos and R. S. Felger, eds. *Biodiversity, ecosystems, and conservation in northern Mexico*. Oxford: Oxford University Press.
- Rodríguez-Estrella, R., M. Cariño Olvera, C. F. Aceves García, compilers. (2004) *Reunión de análisis de los oasis de Baja California Sur: importancia y conservación*. La Paz, Baja California Sur, Mexico: Centro de Investigaciones Biológicas del Noroeste.
- Rodríguez-Estrella, R., Rubio, L. and Pineda, E. (1997) Los oasis como parches atractivos para las aves terrestres residentes e invernantes. Pp. 157–195 in L. Arriaga and R. Rodríguez-Estrella, eds. *Los oasis de la Península de Baja California*. La Paz, Baja California Sur, Mexico: Publ. 13, Centro de Investigaciones Biológicas del Noroeste.
- Rodríguez-Estrella, R., Rubio Delgado, L., Pineda Diez de Bonilla, E. and Blanco, G. (1999) Belding's Yellowthroat: current status, habitat preferences and threats in oases of Baja California, Mexico. *Anim. Conserv.* 2: 77–84.
- SEMARNAT (Secretaría de Medio Ambiente y Recursos Naturales) (2002) Norma Oficial Mexicana NOM-059-ECOL-2001, Protección ambiental-Especies nativas de México de Flora y fauna silvestres-Categorías de riesgo y especificaciones para su inclusión, exclusión o cambio-Lista de especies en riesgo. Diario Oficial de la Federación, Miércoles 6 de Marzo de 2002, Segunda Sección. 81 pp.
- Unitt, P. (2001) Some bird observations from Baja California Sur. *Monogr. Field Ornithol.* 3: 107–111.
- Whitmore, R. C. and Whitmore, R. C. (1997) Late fall and early spring bird observations for Mulegé, Baja California Sur, Mexico. *Great Basin Nat.* 57: 131–141.
- Wilbur, S. R. (1987) *Birds of Baja California*. Berkeley: University of California Press.

RICHARD A. ERICKSON\*

*LSA Associates, 20 Executive Park, Suite 200, Irvine, California 92614, U.S.A.*

ROBERT A. HAMILTON

*7203 Stearns Street, Long Beach, California 90815, U.S.A.*

STEVEN G. MLODINOW

*Puget Sound Bird Observatory, 5501 17th Avenue NE, Seattle, Washington 98105, U.S.A.*

*\*Author for correspondence; e-mail: richard.erickson@LSA-assoc.com*