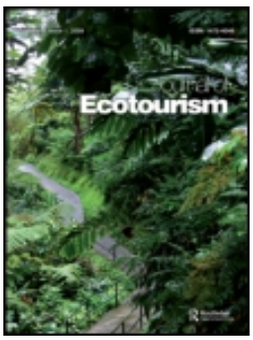

Journal of Ecotourism

ISSN: 1472-4049 (Print) 1747-7638 (Online) Journal homepage: https://www.tandfonline.com/loi/reco20

Celestial ecotourism: new horizons in nature-based tourism

David Weaver

To cite this article: David Weaver (2011) Celestial ecotourism: new horizons in nature-based tourism, Journal of Ecotourism, 10:1, 38-45, DOI: 10.1080/14724040903576116

To link to this article: https://doi.org/10.1080/14724040903576116

Published online: 15 Jan 2011.

Journal of Ecotourism
Vol. 10, No. 1, March 2011, 38–45

Celestial ecotourism: new horizons in nature-based tourism

David Weaver*

Department of Tourism, Leisure, Hotel, and Sport Management, Griffith University, Southport, Australia

(*Received 12 January 2009; final version received 17 December 2009*)

Celestial ecotourism is a neglected and hitherto unrecognised subsector that is dominated by the observation of nocturnal 'megacaela' (mega-skies). Observatories are the single largest component in terms of visitation, while aurora-viewing is the most articulated as a specialised commercial tourism (though not necessarily ecotourism) industry. Given the distance from featured attractions, sustainability is focused not on interaction but on context impacts and especially the need to preserve and restore the dark sky and unpolluted atmospheric conditions that foster charismatic megacaela. A logical emphasis on 'enhancement' sustainability is therefore apparent. Formal recognition and development of celestial ecotourism can be realised through the collaboration of ecotourism organisations with well-established and influential astronomy-related institutions pursuing relevant initiatives such as the creation of 'dark sky' reserves and the designation of 2009 as the International Year of Astronomy.

Keywords: management; nature-based tourism; astronomy; celestial ecotourism; sustainable tourism

Introduction

According to Weaver and Lawton (2007), ecotourism's contemporary 'coming of age' as a legitimate area of academic inquiry is indicated by an escalating output of affiliated refereed journal articles and textbooks, and also by its institutionalisation through entities such as the International Ecotourism Society (TIES), the peer-reviewed *Journal of Ecotourism*, and the UN-sponsored International Year of Ecotourism in 2002. In perhaps a more literal sense, the evolution of ecotourism is also apparent in its 'speciation', that is, in its division of what was once a relatively homogenous product into sub-segments distinctive and large enough to warrant focused management, planning and marketing through specialised institutions and targeted research. First-order speciation within ecotourism is evident in the identification of fairly broad sub-segments such as marine ecotourism (e.g. Cater & Cater, 2007; Garrod & Wilson, 2003) while the emergence of even more specialised activities such as SCUBA diving and cetacean watching indicates second-order speciation. Cetacean watching, in turn, is now recognised as a major subsector in its own right with increasing third-order differentiation made between vessel-based and land-based activity and between interactions involving whales and dolphins (Weaver, 2008). It is variably appropriate to engage each of these highly specialised products at the third-, second- and/or

*Email: d.weaver@griffith.edu.au

ISSN 1472-4049 print/ISSN 1747-7638 online

DOI: 10.1080/14724040903576116
http://www.informaworld.com

first-order level of speciation, or indeed at the parent ecotourism or tourism scale, depending on the goals of relevant agencies.

It is argued here that advanced speciation is currently evident in the emergence of the specialised realm of 'celestial ecotourism', but that this reality has thus far been unaccompanied by any corresponding institutionalisation or concerted academic investigation at any level. The main purpose of this article, subsequently, is to encourage the recognition of celestial ecotourism as a discrete and significant subsector that merits due attention from academics and relevant institutions as the activity which should dominate tourism's emerging engagement with the heavens. In doing so, the core ideals of ecotourism – meaningful participant learning and the maximisation of positive ecological and sociocultural impacts – are more likely to inform this engagement. The first section clarifies the structure of celestial ecotourism by defining the term and proposing a simple classification system. Following a review of the relevant literature, the magnitude of celestial ecotourism is discussed and relevant management issues are raised.

Defining the boundaries

First appearing in Weaver (2008), the term 'celestial ecotourism' can be defined as ecotourism where the interest of visitors is focused on the observation and appreciation of naturally occurring celestial phenomena. This excludes planetariums, which like zoological parks, aquariums and botanical gardens provide decontextualised settings based on 'captivity' and/or reconstruction that are not usually classified as ecotourism attractions *per se* even though they may indirectly support the ecotourism sector through recruitment and other effects. Weaver (2008) provides no elaboration of celestial ecotourism beyond its inclusion in an inventory of ecotourism and nature-based tourism activities which lists 'comets', 'northern lights', 'skygazing', and 'stargazing' as examples of related objects and activities. Just as wildlife-based, vegetation-based, and geologically based ecotourism, respectively, depend on the presence of charismatic megafauna, megaflora, and megaliths, it is proposed here that comets, northern lights, interesting cloud formations, vivid sunsets, and star-filled skies can all be potentially regarded as examples of *charismatic megacaela* (i.e. 'mega-skies') capable of attracting specialised 'celestial ecotourists' and other spectators. The most logical physical way of classifying megacaela is by time of day, which dictates the celestial phenomena that can be observed. Accordingly, megacaela can be nocturnal, diurnal, or crepuscular. Nocturnal or night-time skies include stars, planets, the moon, meteor showers, and northern or southern lights (*aurora borealis* or *aurora australis*). Phenomena associated with diurnal or daytime skies include clouds, rainbows, solar and lunar eclipses, and 'sun dogs' (i.e. solar halos or *parhelia*). Finally, crepuscular or twilight skies reveal transitional features such as sunrises, sunsets, and the midnight sun and also provide optimal viewing conditions for comets. A further distinction can be made between 'naked eye' or unaided observation and 'assisted' or 'aided eye' observation enabled by telescopes and other optical devices.

Literature review

The published academic material on topics directly or even indirectly related to celestial ecotourism is remarkable for its paucity, given the presumed magnitude of the subsector (see below). Aside from the tangential coverage by Weaver (2008), a series of short articles published in a French-language journal in the early 2000s is the only evidence of concerted attention. This coverage, moreover, is descriptive rather than analytical, focuses mainly on

the situation in France, and emphasises non-ecotourism aspects of astronomical tourism such as planetariums (Chaspoul, 2002). This lack of attention invites comparison with the academic literature on 'space tourism', which despite involving only a few thousand participants in sub-orbital or outer space travel, has recently emerged as a popular topic of speculative and empirical investigation (e.g. Ashford, 1990; Bell & Parker, 2009; Brown, 2004; Crouch & Laing, 2004; Prideaux & Singer, 2005; Smith, 2000).

Magnitude

There are no cumulative data on the magnitude of celestial ecotourism, but anecdotal evidence suggests that activities involving nocturnal megacaela are by far the most prevalent. In early 2009, Wikipedia listed approximately 400 active ground-based observatories, but qualified this inventory as substantially incomplete. Astronomical observatories can function as mediating attractions for stargazers in the same way that canopy walkways and Atlantis submarines provide privileged access to forests and mountains, respectively, while being attractive in their own right (Moore, 1996, 2002). The focus on accommodating visitors, however, is variable, with some observatories providing stargazing access only for scientists and students, while others are marketed and managed as major tourist attractions. For example, since 1935 over 7 million visitors have used the Zeiss telescope at Griffith Observatory in Los Angeles (Griffith Observatory, 2009). In the early 2000s, a network of 'Night Station' observatories was initiated in France with the explicit goal of attracting visitors and raising public awareness of astronomy. *Les nuits des étoiles* (the nights of stars) an annual week-long celebration of the heavens, attracted about 150,000 spectators to 250 sites in France and other European countries in 2001 (Cirou & Piednoël, 2002). Complicating the effort to quantify observatory-focused celestial ecotourism is the inclusion of local residents in visitation statistics and the presence of planetariums at many facilities as a focal point of interaction with the public. A further complication is the growing number of unregulated small amateur observatories, some of which may accommodate visitors (Moore, 1996, 2002).

The observation of the *aurora borealis* and *australis* is arguably the next largest subsector involving the observance of nocturnal megacaela, though structured much differently. First, whereas astronomical observatories can be established almost anywhere as long as light pollution is not excessive, viewing conditions that produce charismatic auroras are spatially and seasonally confined to higher latitudes, the darker winter months, and periods of high geomagnetic activity (NOAA, 2007). However, within these constraints, charismatic auroras can be observed with the naked eye, thus creating opportunities for observation from almost any location without the need for major capital investment in facilitating infrastructure. The aurora is therefore an example of a phenomenon accessed from ubiquitous sites within a constrained geography, while deep stargazing is facilitated by constrained sites (i.e. astronomical observatories) within a ubiquitous geography. One implication is the emergence of specialised 'aurora tourism' destinations within the sparsely populated higher latitudes. The *aurora borealis* features prominently in the visual marketing of the government tourism board of Canada's Northwest Territories, and 12,316 'aurora tourists' were alleged to have visited during the 2000/2001 winter season, concentrated in the territorial capital of Yellowknife, compared with about 100 visitors during the 1989/1990 season during which specialised tours were introduced (NWT, 2002). Numbers have steadily declined since then, reaching 6000–7000 by the 2006/2007 season (Western Management Consultants, 2008), in a trend that has been attributed to a desire for more active rather than passive engagement with the lights (CBC News, 2007). Other

notable North American destinations include the Yukon territorial capital of Whitehorse with an estimated 2000 aurora tourists in 2007 and Fairbanks (Alaska) with about 5500. Elsewhere, Finland was credited with 10,000 aurora visits in 2007/2008, while Iceland, Greenland, Scotland, and Russia were also alleged to have a rapidly growing formal engagement with aurora tourism. A further point of differentiation from observatories is the relative importance in all cases of the inbound Japanese tourist market (Western Management Consultants, 2008).

Other modes of celestial ecotourism involving nocturnal megacaela include the naked eye observation of starry skies in sparsely populated areas with low light and air pollution. Deserts are particularly suitable locations, as evidenced by the establishment of the Hamza Astronomical Ecotourism Camp in the desert region of Jordan, and the ongoing development of La Ruta Astronómica (n.d.) in northern Chile, a driving circuit that features night sky observation and solar events as well as related terrestrial features such as meteorite craters and the nocturnal behaviour of indigenous wildlife and vegetation. Tall ship astronomy cruises on the North American Great Lakes indicate another emerging niche product, along with the inclusion of stargazing opportunities as an add-on offered by large cruise companies such as Royal Caribbean and Carnival (Eye on the Sky, 2008).

Diurnal and crepuscular megacaela

Unquestionably, vivid sunsets/sunrises, rainbows, and well-defined clouds contribute positively to almost all forms of tourism, though in such innumerable encounters they are usually an augmentative rather than primary attraction, rarely entail a focused learning experience, and may or may not be situated within an explicit sustainable tourism management framework. In most ecotourism situations, it is only the latter framework that has some probability of being present, although celestial conditions may be indirectly incorporated into interpretation through the impacts that these have on plants and animals (e.g. tidal effects, full moons, precipitation, etc.). Deserts, grasslands, tundras, and large bodies of water are the specialised ecotourism settings most suited to an explicit ‘big sky’ theme, although well-articulated examples are lacking.

A notable component is episodic participation in the observation of eclipses (usually solar but also lunar) and comets. The highly specialised practices of ‘eclipse chasing’ and ‘comet chasing’ are one manifestation which involve individuals who track the path of such events and then travel to optimal viewing locations. Representative websites reveal a subculture immersed in arcane knowledge and terminology and willing to endure considerable expense and hardship to achieve their narrow objectives. Another manifestation is the infrequent but highly publicised eclipse or comet that attracts relatively large numbers of observers. Package tours to Botswana, for example, were widely advertised in Europe during 2002 to take advantage of choice viewing conditions for a total solar eclipse that December (Rousse, 2002). Infrequency of occurrence and the restrictive nature of optimal observation settings, however, will both likely inhibit the development of eclipse and comet viewing into mass participant forms of celestial ecotourism.

Similar to the first manifestation is travel that bears witness to the rising sun at the moment of the summer solstice or other auspicious occasions, although the latter differs substantively from eclipse and comet chasing in the temporal regularity of their occurrence and the designation of specific sites (e.g. Stonehenge) that are deemed to provide privileged access. In addition, any effort to classify or position such activity as a form of celestial ecotourism may be doomed by the extent to which it is already implicated as a cultural rite or celebration of New Age pilgrims, pagans, and others.

Management considerations

The potential components of celestial ecotourism and relevant observations as to their relative magnitude are summarised in Table 1. Management implications are now considered with regard to the ecological and sociocultural sustainability of these activities, and their lack of formal connectivity with the established ecotourism sector.

Ecological and sociocultural sustainability

Observer/attraction 'interaction', with its implications of mutual influence, is a critical management principle in conventional ecotourism involving proximate megafauna, megaflora, or megaliths and the subject of extensive scientific investigation (Buckley, 2004; Weaver, 2008). This concept, however, is effectively meaningless in celestial ecotourism since the heavens are too far removed from the observer to be directly or significantly impacted by the act of observation or the actions that facilitate observation. Instead, attention needs to be focused on two other issues pertaining to ecological and sociocultural sustainability. First, as with other forms of ecotourism, the observation of megacaela can have a significant impact upon the areas from which observation is carried out or facilitated. Four hundred professional observatories and an unknown number of amateur facilities, for example, represent a substantial spatial footprint and consumer of energy and other resources, not to mention the resources consumed by visitors in transit and on site. Many observatories are located in urban areas where the footprint issue is not as critical due to the appropriateness of a 'weak' approach to sustainability (Hunter, 1997). However, others are located in relatively remote locations that offer ideal 'dark sky' viewing conditions but merit a 'strong' or more biocentric sustainability approach. A relevant recent controversy on the island of Hawai'i has involved plans to construct a 44 m high solar telescope next to Haleakala National Park, which opponents describe as a form of visual pollution and a threat to local biodiversity given that construction vehicles can only access the site from a narrow road passing through the park (Odling-Smee, 2007). For aurora-based tourism, observation facilities are not so much a sustainability issue as transit, since the travel of thousands of visitors from origin countries such as Japan to remote high-latitude destinations must involve considerable greenhouse gas emissions.

Table 1. Synopsis of celestial ecotourism phenomena.

Time of day	Attendant megacaela	Remarks
Nocturnal	Stars, Planets, Moon	Observatories accommodate millions of visitors; dark sky conditions essential
	Meteor showers	
	aurora borealis/australis	Specialised high-latitude destinations attract thousands of visitors
Diurnal	Clouds	
	Rainbows	
	Sun dogs (parhelia)	
	Solar/lunar eclipses	Periodic mass events and subculture aspect
Crepuscular	Sunrises	
	Sunsets	
	Midnight sun	
	Comets	Periodic mass events and subculture aspect

The second issue pertains to the conditions under which megacaela become charismatic. Dark skies are the *sine qua non* of magnificent night skies, and celestial ecotourism offers an excellent opportunity to educate observers about the circumstances under which magnificent skies occur and to encourage actions which both preserve existing dark skies and restore the latter in areas where they have been lost to light pollution and other anthropogenic interferences. Atmospheric pollutants, similarly, are a major impediment to the realisation of charismatic daytime features such as well-defined clouds backed by brilliant blue skies. This extreme vulnerability of charismatic megacaela to human activity that occludes the atmosphere suggests a strong potential for celestial ecotourism to emphasise 'enhancement sustainability' or sustainability that actively seeks to improve the existing environmental conditions. This contrasts with 'status quo sustainability' which advocates the 'leave no trace' mentality but is inadequate insofar as it is not focused on actively trying to enhance existing environmental conditions (Weaver, 2005).

Disconnection with the formal ecotourism sector

To this point, the fact that 'celestial ecotourism' exists only as an ideal rather than a reality has deliberately not been raised; few if any observatories, eclipse chasers or providers of aurora-viewing opportunities, to the author's knowledge, regard themselves formally as part of the ecotourism industry or possess membership in relevant organisations. As a result, they may be disadvantageously positioned to engage the learning and sustainability imperatives that distinguish ecotourism from other forms of tourism, thereby taking the opportunities that many no doubt already offer to a new level. The International Astronomical Union (IAU) provides a forum for observatory managers to collaborate on issues of common concern, but these relate more to the promotion and professionalism of astronomy than tangential issues such as tourism which nevertheless can open new revenue streams and expand the outreach process during events such as the 2009 International Year of Astronomy (IYA). Membership in the TIES or a new specialised ecotourism body would create an institutional framework for observatories, aurora-viewing providers and others to focus on learning and sustainability from a specifically tourism perspective.

For the ecotourism sector, engagement with these same operators and their existing non-tourism institutions would yield reciprocal advantages. Their addition to entities such as TIES would substantially increase the latter's membership while opening avenues of collaboration with the well-articulated array of institutions that already consider celestial phenomena. The IAU is illustrative, having within its framework a Commission on Astronomy Education and Development that could accommodate cooperation into the promotion and development of observatories and other facilities as ecotourism attractions as part of the 2009 IYA celebrations and beyond (IAU, 2008). The IAU also collaborates with UNESCO and the International Dark Sky Association (IDSA), an organisation dedicated to the preservation and expansion of dark skies. The expertise on measures to reduce light pollution is already largely invested in the latter organisation and could readily inform appropriate interpretation and sustainability-related actions on the part of operators.

Equally intriguing, given the paramount importance of public protected areas as hosts for ecotourism activity (Lawton, 2001), are efforts by a coalition of major international organisations to establish a network of protected areas where the preservation and enhancement of dark sky conditions is a major strategic directive. The first major institutional initiative towards this goal was the impressively named International Conference in Defence of the Quality of the Night Sky and the Right to Observe the Stars, held in La Palma, Spain, in April 2007 under the sponsorship of UNESCO, IAU and UNWTO. This conference formally

proposed the identification and designation of an international network of UNESCO Starlight Reserves. Significantly, a Declaration was also passed which included recognition of the role of 'responsible tourism' in defending the quality of the night sky and the reciprocal role of quality night skies in enhancing the quality of all types of tourism (Starlight Initiative, 2007). As of early 2009, negotiations and discussion were continuing to designate the Lake Tekapo region of New Zealand as a prototype Starlight Reserve with the possibility that such entities could be nominated for inclusion on the World Heritage List and/or as Biosphere Reserves. In an affiliated initiative, the IDSA has introduced a certification programme for eligible communities, parks, and reserves, the main criterion being the presence of regulations and management frameworks that value and support natural darkness as an educational, cultural, and scenic asset. An active educational and interpretation program, notably, is a core component of the programme. During 2008, Flagstaff (Arizona) and Natural Bridge National Monument (Utah) were respectively designated as the first International Dark Sky Community and International Dark Sky Park (IDSA, 2008).

Conclusions

It can be argued that there are currently two embryonic streams of tourism activity contending for leadership in the new destination frontier of the heavens. Celestial ecotourism is probably very large as a *de facto* sector, but still unrecognised institutionally or as an area meriting academic investigation. In contrast, 'space tourism' has captured the imagination of the public and media as well as a disproportionate number of academic researchers, despite having been experienced by a miniscule number of participants. The extrapolation of this trend suggests that tourism in the heavens will be perceived, accepted, and developed as adventure tourism based on highly exclusive personal encounters with the heavens, controlled by large corporations and agencies capable of facilitating this privileged access.

An alternative (and in this author's opinion more desirable) scenario would position celestial ecotourism as the dominant mode of tourism's engagement with the heavens, driven by core imperatives of learning and sustainability, as well as broad-based accessibility, which transcend idiosyncratic management issues associated with specific subsectors. Especially attractive is the emphasis on enhancement sustainability arising from the need to preserve and restore dark sky and unpolluted atmospheric conditions that foster charismatic celestial phenomena. Such a scenario is attainable through collaboration between institutions representing the ecotourism, astronomy, and other relevant sectors, taking advantage of relevant institutions such as the IYA in 2009. This paper attempts to inspire such an alliance by recognising and imposing a tentative structure on the phenomenon of celestial ecotourism, which is a neglected example of ecotourism speciation. It proposes that observatories are by far the most important *de facto* component in terms of visitation magnitude, while aurora-viewing is the best articulated as a geographically specialised commercial sector explicitly focused on tourism (if not ecotourism). It is through institutions associated with these two subsectors in particular therefore that the second scenario should be pursued, concurrent with efforts to develop the almost entirely ignored ecotourism potential of daytime and twilight megacaela.

A relevant research agenda should initially focus on obtaining a more precise understanding of the magnitude of the observatory and aurora subsectors as well as estimates of actual and latent demand, and the extent to which they actually adhere to the three core criteria of ecotourism. The amenability of managers in these two areas to cooperate with the ecotourism sector and to identify as such should also be investigated. Other celestial megacaela that are not clearly demarcated as primary attractions need to be

scoped with regard to their actual and potential status as secondary attractions that support other forms of ecotourism and tourism, while it would be interesting to see whether eclipse and comet chasers fall legitimately within the realm of the 'ecotourist'.

References

Ashford, D.M. (1990). Prospects for space tourism. *Tourism Management*, *11,* 99–104.

Bell, D., & Parker, M. (Eds.) (2009). Special issue: Space travel & culture: From Apollo to space tourism. *Sociological Review*, *57,* 1–223.

Brown, F. (2004). The final frontier? Tourism in space. *Tourism Recreation Research*, *29*(1), 37–43.

Buckley, R. (2004). *Environmental impacts of ecotourism*. Wallingford: CABI.

Cater, C., & Cater, E. (2007). *Marine ecotourism: Between the devil and the deep blue sea*. Wallingford: CABI.

CBC News. (2007). *Declining Japanese tourism to N.W.T., Canada*. Retrieved January 8, 2009, from http://www.cbc.ca/canada/north/story/2007/08/20/nwt-tourism.html

Chaspoul, C. (Ed.) (2002). Astronomie, tourisme et loisirs. *Espaces, Tourisme & Loisirs*, *191,* 23–49.

Cirou, D., & Piednoël, É. (2002). Faire aimer la nuit. *Espaces, Tourisme & Loisirs*, *191,* 27–31.

Crouch, G.I., & Laing, J.H. (2004). Australian public interest in space tourism and a cross-cultural comparison. *Journal of Tourism Studies*, *15*(2), 26–36.

Eye on the Sky. (2008). *The eye on the sky AstroCruises page*. Retrieved January 12, 2009, from http://www.eyeonthesky.com/astrocruises/index.html

Garrod, B., & Wilson, J. (Eds.). (2003). *Marine ecotourism: Issues and experiences*. Clevedon: Channel View.

Griffith Observatory. (2009). *Griffith Observatory.* Retrieved January 8, 2009, from http://www.griffithobservatory.org/

Hunter, C. (1997). Sustainable tourism as an adaptive paradigm. *Annals of Tourism Research*, *24,* 850–867.

IAU (International Astronomical Union). (2008). *Division XII Commission 46: Astronomy education & development*. Retrieved January 12, 2009, from http://www.iau.org/science/scientific_bodies/commissions/46/

IDSA (International Dark Sky Association). (2008). *International Dark-Sky Association*. Retrieved January 7, 2009, from http://www.darksky.org/mc/page.do

La Ruta Astronómica. (n.d.). *La Ruta Astronomica*. Retrieved January 8, 2009, from http://www.eurochile.cl/site/ruta-astronomica/files/ruta-astronomica-solo-mapa.pdf

Lawton, L.J. (2001). Ecotourism in public protected areas. In D.B. Weaver (Ed.), *The encyclopedia of ecotourism* (pp. 287–302). Wallingford: CABI.

Moore, P. (Ed.). (1996). *Small astronomical observatories*. Berlin: Springer-Verlag.

Moore, P. (Ed.). (2002). *More small astronomical observatories*. Berlin: Springer-Verlag.

NOAA. (2007). *Aurora activity extrapolated from NOAA POES*. Retrieved January 9, 2009, from http://www.swpc.noaa.gov/pmap/

NWT (Northwest Territories). (2002). *Aurora tourism: Economic impact on the NWT.* Retrieved January 8, 2009, from http://www.iti.gov.nt.ca/publications/2007/TourismParks/aurora_tourism.pdf

Odling-Smee, L. (2007). Hawaiian solar telescope meets resistance. *Nature*, *447,* 758–759.

Prideaux, B., & Singer, P. (2005). Space tourism – a future dream or cyber-space reality? *Tourism Recreation Review*, *30*(3), 27–35.

Rousse, M. (2002). Voyager la tête en l'air. *Espaces, Tourisme & Loisirs*, *191,* 34–35.

Smith, V.L. (2000). Space tourism: The 21st century 'frontier'. *Tourism Recreation Research*, *25*(3), 5–15.

Starlight Initiative. (2007). *Starlight Initiative*. Retrieved January 6, 2009, from http://www.starlight2007.net/theinitiative.htm

Weaver, D.B. (2005). Comprehensive and minimalist dimensions of ecotourism. *Annals of Tourism Research*, *32,* 439–455.

Weaver, D.B. (2008). *Ecotourism* (2nd ed.). Brisbane: Wiley.

Weaver, D.B., & Lawton, L.J. (2007). Twenty years on: The state of contemporary ecotourism research. *Tourism Management*, *28,* 1168–1179.

Western Management Consultants. (2008). *Northwest Territories aurora viewing tourists (Phase II: analysis of competition for the NWT)*. Retrieved January 8, 2009, from http://www.iti.gov.nt.ca/publications/2008/tourismparks/AuroraCompetitiveAnalysis-Phase2-2007.pdf