

Chronicle of a World Heritage Nomination: The Joggins Fossil Cliffs, Nova Scotia, Canada

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Introduction

A timeline of the initiatives that lead ultimately to the nomination of a property for inscription on the UNESCO World Heritage List comprises distinct, incremental phases as support and confidence in the nomination grow both locally and internationally. Although the steps required and the path followed by each World Heritage Site will be unique, reflecting the circumstances of each site and the jurisdictions in which they reside, some of these are broadly applicable to other nominations and may prove to be instructive as a case study, complementary to the detailed advice provided in the Operational Guidelines for World Heritage (UNESCO, 2005). In this paper, an analysis of the steps toward World Heritage nomination is documented for the Joggins Fossil Cliffs (Fig. 1), nominated by Canada in 2007 as a natural site.

This analysis draws on the author's perspective as advocate, scientific advisor, and senior author of the World Heritage nomination, spanning its inception through submission to the World Heritage Centre in Paris.

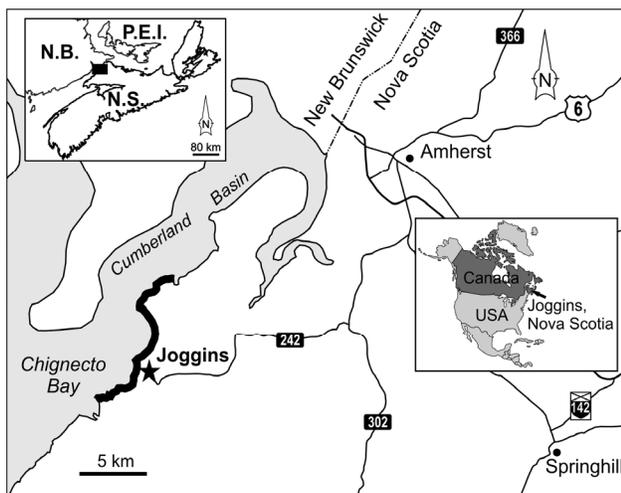


Figure 1. Map showing the location of the Joggins Fossil Cliffs.

The Joggins Fossil Cliffs

The nomination of the Joggins Fossil Cliffs (NTS 21H/09; Fig. 2) was submitted in 2007 under the aegis of Criterion viii of the Operational Guidelines (UNESCO, 2005) as “an outstanding example in the world of a stage of earth history, including the history of life ...”, specifically as the iconic site of the Carboniferous “Coal Age” that fuelled the Industrial Revolution, and which bears witness to the first reptiles in earth history. These first reptiles marked the adaptation of vertebrate life to land, and were the earliest representatives of the amniotes, a group that includes reptiles, dinosaurs, birds and mammals. The case for inscription rests primarily on three pillars (Fig. 3): (1) the seminal role that Joggins has played in science; (2) the terrestrial fossil record, which is doubly significant because of its ecological context; and (3) the grand exposure of the geological record in the cliffs on the Bay of Fundy coast (see Appendix for the full Statement of Outstanding Universal Value).

The site has been well established in scientific literature since its discussion in the pages of *The Origin of Species* by Darwin (1859), and has come to be known as the “Coal Age Galapagos” (Calder, 2006). Fully 101 years before ratification of the World Heritage Convention, Sir Charles Lyell, founder of modern geology, proclaimed the cliffs to be “the finest example in the world” of the rocks and fossils of the ‘Coal Age’ (Lyell, 1871).

The Road to World Heritage at Joggins: A Case Study

The timeline of bringing forward the nomination of the Joggins Fossil Cliffs (Fig. 4) spans 16 years from the time that possibility of World Heritage inscription was first recommended and investigated. It is fair, however, to consider ‘Mile Zero’ on the road as the formal legislative



Figure 2. Photograph of the Joggins Fossil Cliffs at low tide.

protection of the site under the laws of the Province of Nova Scotia in 1970 and 1980. Milestones along the path to World Heritage nomination are indicated on Figure 5. Particularly instructive are: (1) the sequential order of these milestones, some of which were critical to moving the nomination forward; and (2) the time span between milestones and of the stages in the nomination process.

Component Stages

The nomination of Joggins gained consensus and experienced an increase in commitment incrementally, commensurate with increased assurance that the site is indeed likely to be formally nominated and that the nomination is likely to be successful. Much of the process of developing a World Heritage nomination, therefore, involves confidence building.

The path to nomination can be seen as comprising the following component stages (see Fig. 4):

1. Protective designation.
 2. Awareness building and commemoration.
 3. Studying the potential for World Heritage inscription.
 4. Consensus building (culminating with commitment from government and naming to Tentative List).
 5. Consultation with the community (including consensus building above).
 6. Formation of a broad-based steering committee.
 7. Preparation and strategic development of the case.
 8. Commitment from government: (a) in principle; and (b) financially.
 9. Planning for site management.
 10. Infrastructure planning and development.
 11. Nomination assembly and critical review within the country, culminating in its formal submission to the World Heritage Bureau.
- Subsequent stages include:
- Evaluation by the World Conservation



Figure 3. Joggins is recognized for its fossil content, unmatched exposure and the contribution it has made to the history of scientific thought.

Union (IUCN), or in cases of cultural sites, by International Council on Monuments and Sites (ICOMOS)

- Decision (World Heritage Committee).

These stages fall into three categories of relative timing:

1. Intermittent and/or longer term (several years: e.g. consensus building).
2. Concentrated, short term (several months up to two years: e.g. tentative list evaluation, nomination assembly).
3. Concurrent with other stages (e.g. infrastructure planning and development).

Protective Designation

The Joggins coastal section was first protected under legislation of the Province of Nova Scotia in 1970 (*Historical Objects Protection Act*, succeeded in 1980 by the *Special Places Protection Act*). This important action, undertaken by visionary Director of the Nova Scotia Museum, J. Lynton Martin, formally established the intrinsic value of the site to the province, and fomented subsequent action on site development and management.

Awareness Building and Commemoration

In 1989, the author began to seek commemorative designation of the cliffs which would incrementally build awareness and support at home for World Heritage nomination. A proposal was made to the Chief Scientist (R. P. Riddihough) of the Geological Survey of Canada (GSC) that the federal government formally recognize Joggins as the site of the first field project of the GSC on its 150th Anniversary in 1992. The commemoration in turn assisted the community in securing funds for a building to house a new fossil centre for the Donald Reid collection, built at the site of the monument on Main Street. From its opening in 1993 through 2006, the Joggins Fossil Centre, privately run by the Donald Reid family, fulfilled the role of site interpretation, a remarkable example of community stewardship.

Studying the Potential for World Heritage Inscription

Under the Canada-Nova Scotia Tourism

The Road to World Heritage Nomination of The Joggins Fossil Cliffs

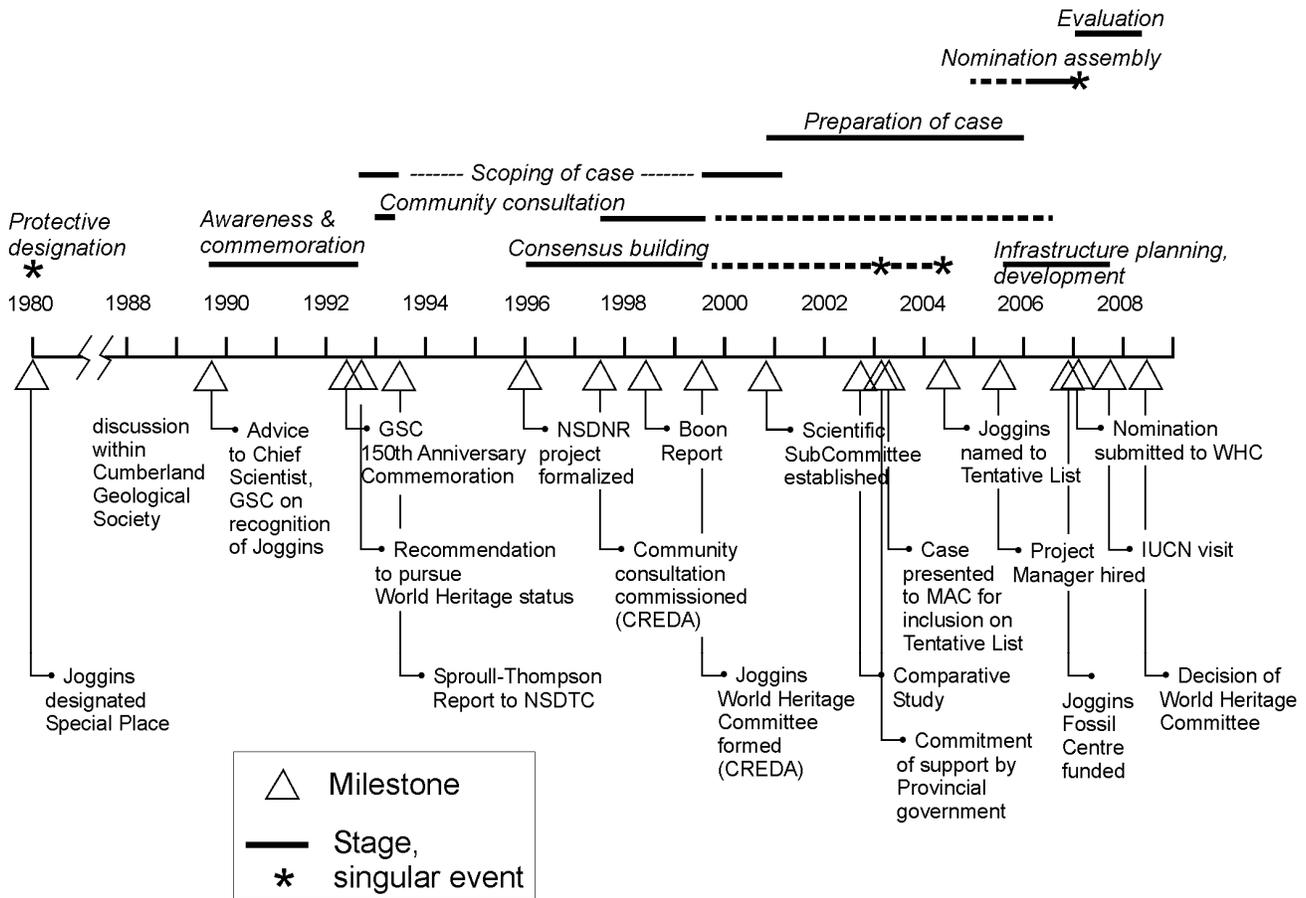


Figure 4. Timeline of the effort to nominate the Joggins Fossil Cliffs as a UNESCO World Heritage Site.

Development Agreement for 1992-1995, a tourism development and management plan for the cliffs was commissioned by the Nova Scotia Department of Education and Culture (Nova Scotia Museum, under the direction of Robert Frame and Robert Ogilvie), and undertaken by Janet Sproull-Thompson for consultants Jacques Whitford and Associates.

In a letter of November 18, 1992, the author made the following recommendations to the consultant (here abridged) to:

1. Involve local people in the process.
2. Expand the area protected under the *Special Places Act*.
3. Consider a full-scale interpretive centre, associated library and research centre, and possibly an affiliated paleontological institute.
4. Emphasize enduring international

significance, including earliest reptiles.

5. Consider the great potential of natural sites as a sustainable economic driver; link development at Joggins with the Fundy Geological Museum at Parrsboro.

6. Nominate the cliffs as a World Heritage Site.

With the submission 15 years later of the nomination of the Joggins Fossil Cliffs to UNESCO, all six recommendations have been acted upon.

In-depth study of the potential and nomination process was undertaken by the author in concert with the formation of the first Joggins World Heritage planning committee in 1999, co-ordinated by the Cumberland Regional Economic Development Association (CREDA), under the leadership of Rhonda Kelly, its Executive Director.

Consensus Building

Building confidence among key government agencies in the prospect of the cliffs as a World Heritage site was an important, albeit largely informal process. In 1996, the Nova Scotia Department of Natural Resources approved a formal initiative, 'Economic Development of Fossil Sites in Nova Scotia'. Central to this initiative was the World Heritage nomination of Joggins, to be undertaken jointly with relevant government agencies, including the Nova Scotia Museum.

An informal working group of international scientists collaborated to fill gaps in the scientific literature throughout the duration of the nomination timeline, providing an important bridge between historic and current research at the site, and raising the significance of the site within the scientific community.

Consultation with the Community

The Sproull-Thompson report, although limited in its justification for World Heritage inscription, would serve as an important catalyst within the community. The report was brought to the attention of the Cumberland Regional Economic Development Association (CREDA) by Joggins resident Mark Boon in 1997, triggering a second round of community consultation led by Boon with the support of CREDA, and leading ultimately to CREDA's co-ordinating role. Consultation continued as a component of developing a management strategy for the site as a Special Place (undertaken by Robert Ogilvie, Nova Scotia Museum), concurrently with the World Heritage initiative.

Formation of a Broad-based Committee

A milestone in the pathway to nomination was the formation of a steering committee facilitated by CREDA, (under the direction of Executive Director Rhonda Kelly), who brought together community and government representatives to formally investigate the World Heritage potential of Joggins. The leadership shown by CREDA facilitated discussion among various government agencies on

neutral ground, and ensured that the community was actively engaged.

Following the naming of Joggins to Canada's Tentative List, this committee evolved in 2005 into an overseeing Advisory Board, comprising community leaders and senior representatives of municipal, provincial and federal government agencies, and ultimately, with the formation of the Joggins Fossil Institute Association, into its Board of Directors.

Preparation and Strategic Development of the Case

With the formation of the steering committee, exploration of the case was undertaken in depth. Development of the justification for inscription, a key component of the formal nomination document, was undertaken by a Scientific Subcommittee, formed in 2000 and chaired by the author.

During this time, a comparative analysis of global sites with which Joggins ultimately would be compared was commissioned by CREDA under the supervision of the scientific chair and undertaken by Howard Falcon-Lang, University of Bristol, England. Although not mandatory prior to 2005, a comparative analysis was nonetheless considered to be essential in securing a place for Joggins on the Tentative List for Canada for two reasons: (1) Joggins was not expressly named in the indicative list of fossil sites prepared in the briefing paper by Wells (1996) to the IUCN, and (2) documentation in possession of the federal agency responsible for World Heritage in Canada (Parks Canada Agency) was known by the Scientific Subcommittee to be inadequate.

Commitment from Government

Consensus for World Heritage nomination was formally recorded in a memorandum of understanding by Deputy Ministers of three key departments of the Nova Scotia government: (1) Natural Resources, (2) Tourism, Culture and Heritage, and (3) the Office of Economic Development. The catalyst for this memorandum of understanding was the presentation of the case to the Ministers' Advisory Committee of the federal

government for the inclusion of Joggins on the Tentative List for Canada. The naming of Joggins to the Tentative List was pivotal to the nomination initiative, and by confirming its future nomination to UNESCO this was a key step in galvanizing government support.

Financial commitment by municipal, provincial and federal governments to infrastructure development was achieved in 2006, on the eve of the submission of the nomination dossier. This commitment was secured largely by the efforts of the project manager (Jenna Boon) and CREDA Executive Director (Rhonda Kelly), with the influential support of the Joggins Fossil Cliffs Advisory Board. The formation of the Advisory Board, with representation of key agencies by senior government officials, was strategically important to securing government support in matters of finance and policy.

Planning for Site Management

Although work on the management of the cliffs was intermittent, it spanned virtually the entire timeline of the nomination. Background research for management of the site as a Special Place and prospective World Heritage Site began in 1991 by Robert Ogilvie and Robert Grantham, curators (respectively) of Special Places and Geology with the Nova Scotia Museum. Work on developing a management plan for the site as a Special Place paralleled formation of the World Heritage planning committee in 1999, and was adapted by the project manager (Jenna Boon), with input from Parks Canada Agency (Todd Keith), to conform to the Operational Guidelines for World Heritage (UNESCO, 2005).

Management at the site will fall to a not-for-profit society, the Joggins Fossil Institute Association, a model similar to that employed at the Dorset and East Devon Coast World Heritage Site, England. The Institute will be empowered to act on behalf of the province in matters pertaining to protection and stewardship of the site.

Infrastructure Planning and Development

Infrastructure at the site in support of interpretation for visitors and for site stewardship and

management was conspicuous by its absence, the role being largely fulfilled by the privately operated Joggins Fossil Centre of the Reid family. Planning and development of infrastructure was co-ordinated by the project manager, and the content was directed by the scientific advisor. Although infrastructure planning was undertaken relatively late and required simultaneous attention of the project manager and scientific advisor to both the nomination dossier and interpretation development, it provided the opportunity to ensure that the interpretation message paralleled and supported that of the nomination.

The need to have a person dedicated to bringing together the disparate components required before Joggins could be assessed as a potential World Heritage Site was identified by the steering committee once Joggins had been named to Canada's Tentative List. A contract position was created within CREDA for a project manager and was filled in 2005 by Jenna Boon, who is also a former resident of the community. The manager filled the key role of overseeing contracts for infrastructure and nomination support, co-ordinating land-use planning with the municipal government, securing funding commitment from all levels of government, and ensuring that the community remained informed of progress.

Assembly, Review and Submission of the Nomination

Preparation of the nomination began with the work of the Scientific Subcommittee in late 2000. The scientific advisor served as senior author, ensuring that the strategic message of outstanding universal value that is central to the case for World Heritage inscription formed the spine of the nomination dossier. Preparation of the nomination dossier required close co-operation between the scientific advisor in the capacity of lead author and the project manager, who co-authored the nomination and who bore the task of bringing to the nomination the disparate components required from various working groups and agencies.

Critical review of the nomination dossier was undertaken over the course of several critiques by World Heritage staff of Parks Canada Agency, to ensure that the documentation reflected, and would meet or exceed, expectations of the World Heritage

Committee during the review process. As part of this critical review, the main body of the dossier and key maps were submitted for preliminary technical analysis by the World Heritage Bureau, Paris, four months prior to its formal submission.

Evaluation (by WHC and IUCN)

Once the nomination is formally submitted for the annual deadline on 1 February 2007, a process is set in motion that culminates 17 months later with the decision of the World Heritage Committee at its annual session in June of the following year. In the interim, the nomination is evaluated by the World Conservation Union (IUCN), which conducts a site visit later in the year that the nomination is submitted.

Recommendations

1. *Preliminary assessment.* Early on in the process of considering a site for World Heritage nomination, it is crucial to evaluate the potential of the site to succeed. The most likely candidate for this role is an academic or scientific authority familiar with the site and its global context.
2. *Strategist.* It is equally crucial that the scientific authority be aware of UNESCO Operational Guidelines, available at <http://whc.unesco.org/en/resources>, in order to develop and advise on the best strategic course for the nomination, identifying strengths and weaknesses in the forthcoming nomination. As the guidelines constantly evolve, it is important that a close working relationship be forged with the World Heritage representative for the country.
3. *Authoritative advocate.* Continuity of scientific authority throughout the preliminary consideration and formal nomination process is a particular challenge, given the pressures on authorities affiliated with academic institutions that require competitive publication output. Recently retired authorities, or those affiliated with government agencies, may be better positioned to fulfill this role, supported by colleagues at academic institutions.
4. *Comparison and collaboration* with authorities who developed the strategic case for inscribed World Heritage Sites in the same category is highly recommended. Access to the nomination review and recommendations for all inscribed sites are available at <http://whc.unesco.org/>.
5. *Community support* is essential, as few sites globally are uninhabited, either within their boundaries or surrounding areas. Communities must be comfortable with the requirements and changes that will attend World Heritage inscription, and can fulfill important roles as stewards of the site. Furthermore, political support for the nomination in many countries will be sensitive to the level of community support. Therefore, community participation should be established as early in the process as possible.
6. *Endorsement by government.* With community support and assurance of the authority that the site meets UNESCO requirements for World Heritage inscription, government agencies and political representatives must formalize their collective support, ultimately leading to the inclusion of the site on the Tentative List, which each country is required to file with the World Heritage Bureau.
7. *Operational funding.* Governments and their agencies that represent the country at the level of managing the nominated property must accept in principle that it is incumbent upon them to dedicate annual operational funds in order to protect and manage the site in perpetuity.
8. *Lead agency/secretariat.* As the nomination process proceeds, the complexity of the project increases due to the need for simultaneous co-ordination and communication between agencies, as well as the need to raise to World Heritage standards any areas in the stewardship of the site that are deficient. Ideally, one agency should be designated as the co-ordinator of the nomination, while taking care not to alienate colleagues and sister agencies that will be required to play a role in site stewardship if the site is inscribed. An alternative model entails formation of an intra-agency secretariat, which may also leverage dedicated funding for its operations.
9. *Project co-ordination and facilitation.* Once the decision to proceed with the nomination is agreed upon by the responsible agencies, a project co-ordinator should be appointed or named in order to facilitate communication between agencies and individuals and to ensure that input by various working groups to the nomination author(s) adheres to required timelines.

10. *Ongoing nomination authority.* It is essential that the long-term role of strategist and authority be maintained to ensure that the nomination follows its strategic path to establishing the site's outstanding universal value and stewardship in perpetuity for future generations.

Conclusions

The nomination of a property for inscription on the World Heritage list is a lengthy process that inevitably begins with the passion of one or more individuals that must be conveyed ultimately to the world. Equally required is the knowledge that the road is long. Although various persons and agencies will serve key roles at different stages of the nomination process, it is essential to maintain core expertise for the nomination strategy throughout its development. Involvement of the community at an early stage is of paramount importance, and financial commitment by government agencies responsible for site management is a prerequisite of a successful nomination.

Appendix: Justification (Statement of Outstanding Universal Value) from the World Heritage Nomination of the Joggins Fossil Cliffs

The coastal cliffs at Joggins reveal the most complete fossil record in the world of terrestrial life in the Pennsylvanian “Coal Age” of earth history. Nowhere is this record of the evolution of life on land and biodiversity in the tropical “Coal Age” - encompassing plant, invertebrate and vertebrate life - rendered more evocatively. The magnificently exposed succession of sedimentary layers preserves the fossils *in situ*, providing environmental context that is unrivalled in the world. The fossil record includes the two defining, iconic elements of the “Coal Age”: fossil forests of the “coal swamps” and the first reptiles, which as the earliest amniotes are the oldest known representatives of reptiles, birds and mammals. The origin of amniotes, the first vertebrates to achieve the capacity to reproduce on land, was one of the most significant

events in the history of life on earth, an evolutionary milestone first recorded with certainty at Joggins. No other locality in the world has provided as much knowledge of the nature of early amniotes or more informative specimens for linking them to more primitive groups of Palaeozoic tetrapods, and to the world in which they lived. Through the power of the Bay of Fundy tides, which are unsurpassed in the world, ongoing discovery is ensured at this site of outstanding universal value.

This dramatic setting is home to what Sir Charles Lyell, founder of modern geology, described as “the finest exposure in the world” of the rocks and fossil record of the Pennsylvanian “Coal Age” of earth history. The fossil record of Joggins has figured in the first debate on evolution, and remains pivotal to understanding the terrestrial origins of vertebrate life, including our own species. This uniquely representative chapter of the earth's history has been the subject of the research and writings of some of the world's most influential scientists since the mid-nineteenth century. Joggins has figured in such seminal works as *Principles of Geology* by Lyell and *The Origin of Species* by Charles Darwin, and has come to be known as a ‘Coal Age Galapagos’.

Selected Bibliography

- Boon, J. and Calder, J. H. 2007a: Nomination of the Joggins Fossil cliffs for Inscription on the World Heritage List; Joggins Fossil Institute, 129 p.
- Boon, J. and Calder, J. H. 2007b: Joggins Fossil Cliffs: Nominated Property and Buffer Area; Nova Scotia Department of Natural Resources, Open File Map ME 2007-2, scale 1:20 000.
- Calder, J. H. and Boon, J. 2007c: Joggins Fossil Cliffs: Property Nominated for World Heritage Inscription; Nova Scotia Department of Natural Resources, Open File Map ME 2007-1, scale 1:20 000.
- Calder, J. H. 2006: ‘Coal Age Galapagos’: Joggins and the lions of Nineteenth Century geology; *Atlantic Geology*, v. 42, p. 37-51.
- Calder, J. H., Gibling, M. R., Scott, A. C., Davies, S. J. and Hebert, B. L. 2006: A fossil lycopsid forest succession in the classic Joggins section of Nova Scotia: paleoecology of a disturbance-

- prone Pennsylvanian wetland; in S. Greb and W. A. DiMichele (editors), *Wetlands Through Time*; Geological Society of America, Special Paper 399, p. 169-195.
- Carroll, R. L. 1970b: The earliest known reptiles; *Yale Scientific Magazine*, p. 16-23.
- Darwin, C. 1859: *On The Origin of Species by Means of Natural Selection*; John Murray, London, 296 p.
- Dawson, J. W. 1863: Air-breathers of the Coal Period: a descriptive account of the remains of land animals found in the coal formation of Nova Scotia with remarks on their bearing on theories of the formation of coal and of the origin of the species; Dawson Brothers, Montreal, Quebec, 81 p.
- Dawson, J. W. 1882: On the results of recent explorations of erect trees containing animal remains in the coal formation of Nova Scotia; *Philosophical Transactions of the Royal Society of Canada*, Part II, v. 173, p. 621-659.
- Davies, S. J., Gibling, M. R., Rygel, M. C., Calder, J. H. and Skilliter, D. M. 2005: The Pennsylvanian Joggins Formation of Nova Scotia: sedimentological log and stratigraphic framework of the historic fossil cliffs; *Atlantic Geology*, v. 41, p. 115-142.
- Falcon-Lang, H. J. 2002: Comparative analysis of Pennsylvanian fossil sites; report prepared for CREDA as part of the nomination dossier, 119 p.
- Falcon-Lang, H. J. and Calder, J. H. 2004: UNESCO World Heritage and the Joggins cliffs of Nova Scotia; *Geology Today*, v. 20, Part 4, p. 140-144.
- Lyell, C., 1871: *The Student's Elements of Geology*; John Murray, London, 624 p.
- Lyell, C. and Dawson, J. W. 1853: On the remains of a reptile (*Dendrerpeton acadianum*, Wyman and Owen), and of a land shell discovered in the interior of an erect fossil tree in the coal measures of Nova Scotia; *Quarterly Journal of the Geological Society*, London, v. 9, p. 58-63.
- Parks Canada 2004: *Canada's Tentative List for World Heritage Sites*; Parks Canada Agency, Ottawa.
- UNESCO 2005: *Operational Guidelines for the implementation of the World Heritage Convention*; World Heritage Centre, Paris, 149 p.
- Wells, R. T. 1996: *Earth's Geological History - A Contextual Framework for Assessment of World Heritage Fossil Site Nominations*; World Heritage Centre, World Conservation Monitoring Centre, IUCN, Gland, Switzerland.