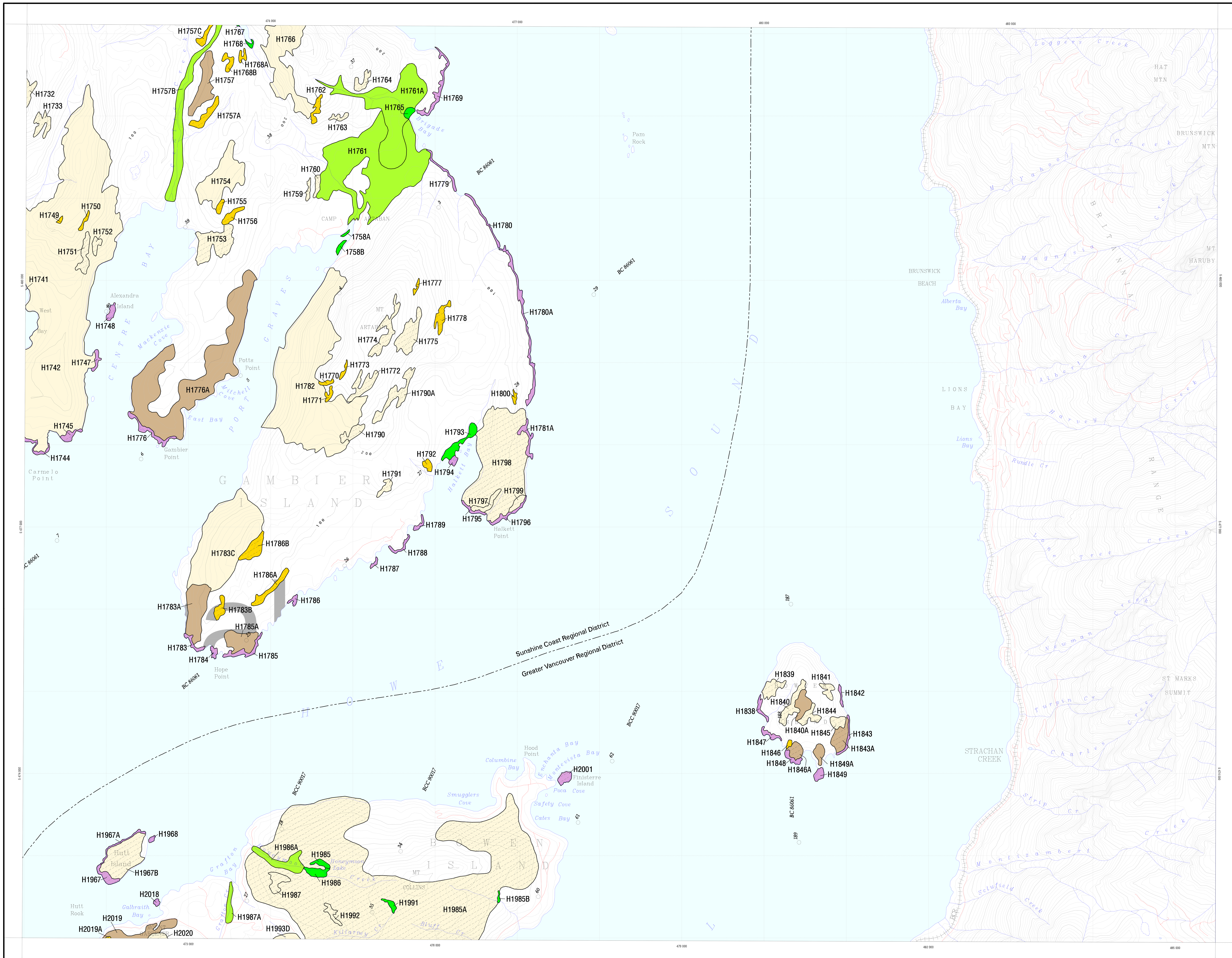
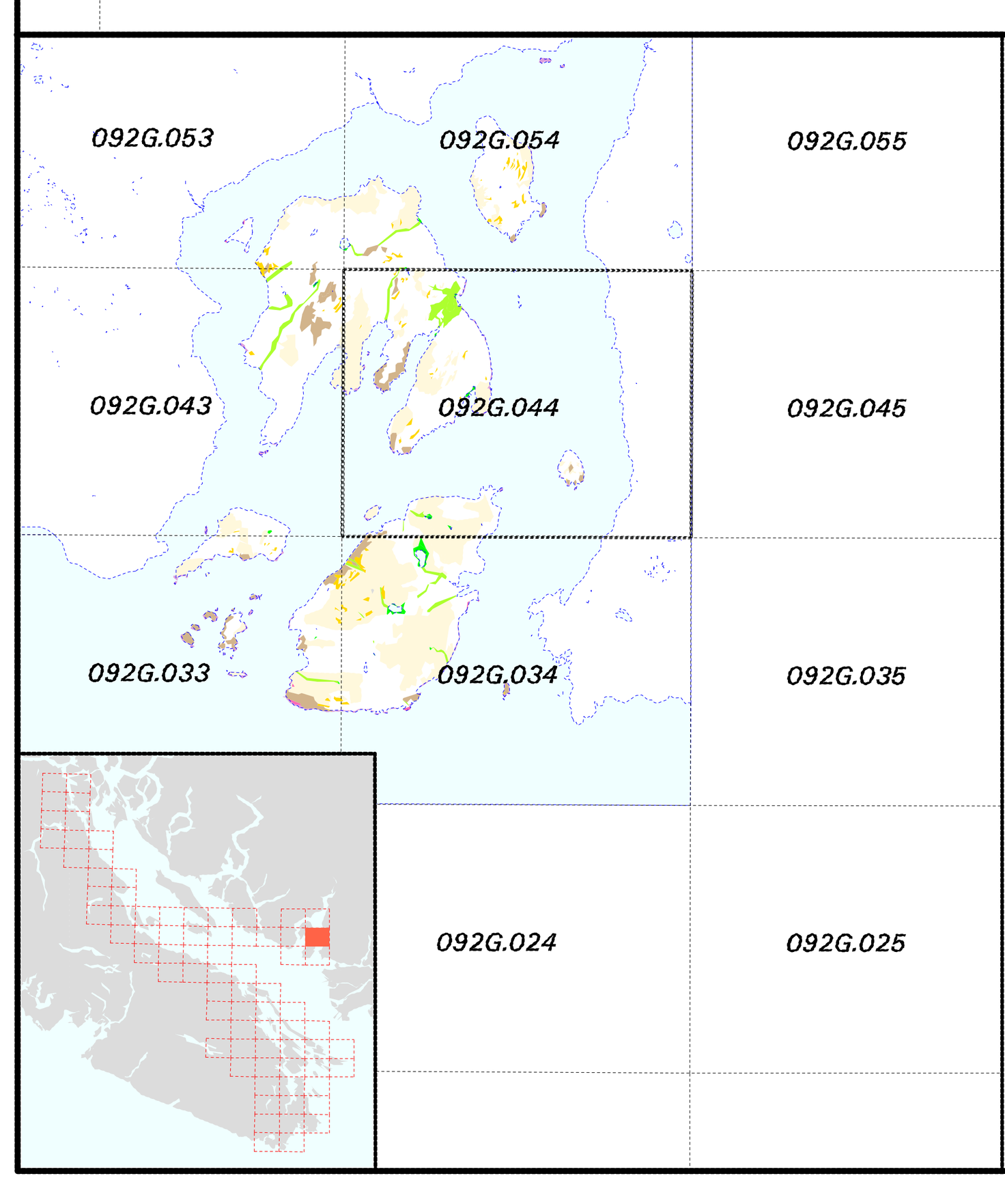
92G.044





Environment Canada / Environnement Canada

HABITAT CONSERVATION TRUST FUND

BRITISH COLUMBIA
Ministry of Environment, Lands and Parks

Sensitive Ecosystems Inventory Bowen/Gambier Trust Areas

92G.044

200 0 200 400 600 800 1000 metres

Scale: 1:20,000

UTM Projection, NAD83, Contour interval 20 metres

August 1999

Sensitive Ecosystems Inventory Project

Sensitive Ecosystems

For this project: ecosystem is defined as a portion of landscape with a relatively uniform dominant vegetation; sensitive ecosystems are those which are fragile and/or rare.

Rationale

Vancouver Island´s eastern coastal lowland and adjacent Gulf Islands comprise an ecological region unique in Canada. The Mediterranean-type climate and long growing season support many rare species of plants and animals as well as a variety of productive ecosystems. It is also one of two areas in British Columbia where the greatest loss of natural systems has occurred and continues to occur. Intense development pressures throughout this region have resulted in the fragmentation and loss of most of these natural areas.

The Sensitive Ecosystems Inventory (SEI) project identifies the remnants of these rare and fragile terrestrial ecosystems to encourage land-use decisions which will ensure their continued ecological integrity.

Ecological Significance

The ecological significance of these sensitive ***terrestrial ecosystems*** is primarily based on their fragility and rarity, but also on the variety and number of species they support. ***Older forests*** - Forests older than 100 years are rare in this region. Structural features of these forests are important to many species including birds of prey, small mammals and amphibians. ***Woodlands*** - These ecosystems include open stands of Garry oak (the only native oak species in western Canada) and mixed stands of Garry oak/Arbutus, Garry oak/Douglas-fir and Arbutus/Douglas-fir. Urbanization has destroyed most of these woodlands and the few remaining sites are under constant threat of development. Woodlands support several rare plant and invertebrate species. ***Coastal bluffs*** - The ephemeral pools which occur in these areas provide critical habitat for several rare plant species. Coastal cliffs also provide valuable seabird nesting sites. ***Terrestrial*** herbaceous ecosystems - These areas are mosaics of rare coastal grassland and moss-covered rock outcrops. More typically occurring as openings in forested areas, these sites provide excellent habitat for butterflies, Black-tailed deer and the rare Sharp-tailed Snake. ***Sparsely vegetated ecosystems*** - These include rare sand dunes, spits and inland cliffs.

In this dry region, wet habitats take on added significance, supporting a rich diversity of plants and animals; they also play a role in maintaining hydrological regimes, filtering out pollutants, controlling peak flows and maintaining water quality and temperatures. Since many of them are known to have been destroyed or altered, the remaining sites require urgent conservation or management to avoid losing the rich biodiversity of this region. ***Riparian ecosystems*** - These floodplains, lake shores and gullies provide an abundance of food, shelter and breeding sites for bird, mammal, amphibian and invertebrate species. ***Wetlands*** - These are essential resting, feeding and breeding sites for ducks, songbirds, fish, amphibians and rare invertebrates. Wetlands also support a variety of rare plants.

Two additional ecosystems were mapped for general biodiversity values. ***Seasonally flooded agricultural fields*** - These fields provide valuable habitat for overwintering waterfowl. ***Older*** second growth forests - Due to the paucity of older forests in this region, larger stands of 60-100 year old forest were identified as potential areas of future older forests. They also provide connecting corridors between other natural areas.

Although not included in this particular inventory, streams and lakes are equally important. They are vital to the survival of fish, waterfowl and amphibian populations as well as the associated aquatic organisms and vegetation upon which these populations depend. For further information on aquatic ecosystems and their protection, please contact the Department of Fisheries and Oceans (DFO) or the B.C. Ministry of Environment, Lands and Parks.

Methodology

The SEI systematically identified, classified, mapped and evaluated these sensitive ecosystems throughout the coastal lowland, from north of Campbell River south to Sooke, and including the adjacent Gulf Islands. The study area is located in the Capital, Cowichan Valley, Nanaimo and Comox-Strathcona regional districts and the Islands Trust area.

Approximately 7000 sites were identified in an area of roughly 4000 sq. km. The minimum mapping size for non-forested areas was one-half hectare. The minimum mapping size for forested areas varied based on age class and structural stage.

The initial phase of the SEI project (1993/94) involved the interpretation of approximately 3000 air photos (mostly at scales of 1:10 000 to 1:15 000) and the compilation of existing knowledge. The second phase (1994/95) consisted of field checking approximately 30% of all sites identified in Phase 1, to verify boundaries, classify, photograph and evaluate present conditions. The final phase (1995/97) involved compiling and editing all data, digitizing sites outlined on the air photos using the Mono Restitution method and producing digital and hardcopy maps. A technical report has been produced which provides a summary and analysis of the data.

A simplified version of this SEI data has been combined with aquatic ecosystem information, cadastral data and orthophoto maps by the recent ***Sensitive Habitat Atlas*** project coordinated by the Habitat and Enhancement Branch, DFO, Vancouver.

Data Limitations

The SEI data is intended to be used for a wide variety of land-use planning processes. For site-specific evaluations, more detailed assessments are recommended. The accuracy of the boundaries of the mapped SEI data is limited by the scale of the air photos on which the sites are delineated. **Enlargement of the data beyond** the source scale may result in unacceptable distortion and faulty registration with other data sets. The scales and dates of air photos used for each map sheet are listed below; the air photo flight line numbers and photo centres are located on each map.

Due to the rapid changes occurring in this region, it is important to refer to the dates of the information sources. For those sites which were not visited, the accuracy of the data depends heavily upon professional judgement and available source material.

Participating Agencies

Environment Canada (Canadian Wildlife Service), the Habitat Conservation Trust Fund and B.C. Ministry of Environment, Lands and Parks (Vancouver Island Regional Office, Nanaimo and Conservation Data Centre, Victoria) combined resources to conduct this project. Additional funds were contributed by B.C.´s Corporate Resources Inventory Initiative, B.C. Ministry of Forests, Capital and Comox-Strathcona Regional Districts, Provincial Capital Commission, Islands Trust and the municipalities of Nanaimo and Campbell River. Fisheries and Oceans Canada provided additional stream data to supplement the TRIM base maps.

***

Digitizing: Integrated Mapping Technologies, Vancouver.
Cartography: Clover Point Cartographics Ltd., Victoria.
Base Mapping Data: Selected digital layers are from the Terrain Resources Information Management (TRIM) Program, Geographic Data BC, Ministry of Environment, Lands and Parks. Victoria, 1993.

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For further information please contact:
B.C. Conservation Data Centre (250) 387-0732
http://www.elp.gov.bc.ca/rib/wis/cdc
or
Environment Canada, Canadian Wildlife Service
(250)752-9611
http://www.cws-scf.ec.gc.ca

Sensitive Ecosystems Inventory Bowen/Gambier Trust Areas

Sensitive Ecosystems

CB — **Coastal bluff**
Vegetated rocky islet, rocky shoreline/grassland, rocky shoreline/moss; coastal cliff (cl)

HT — **Terrestrial herbaceous**
Natural grasslands or bryophyte-dominated vegetation, including rock outcrop/grassland and rock outcrop/moss types (ro); >20% shrub cover (sh).

OF — **Older forest**
Forest ecosystem with dominant age class >100 years; coniferous (co), mixed with broadleaf component > 15% (mx).

RI — **Riparian**
All stages of floodplain vegetation including riparian vegetation associated with gullies (g). Structural stages: 1, 1a, 1b, non-vegetated/sparse; 2 herb; 3 shrub/herb; 3a low shrub; 3b tall shrub; 4 pole/sapling; 5 young forest; 6 mature forest; 7 old forest.

SV — **Sparsely vegetated**
Ecosystem with sparse vegetation; cliff (cl), sand dune (sd), spit (sp).

WN — **Wetland**
Ecosystem with wet soil and moisture-dependent plants: bog (bg), fen (fn), marsh (ms), swamp (sp), shallow water (sw), wet meadow (wm).

WD — **Woodland**
Open woodlands (stands of Garry oak and mixed stands of Garry oak/Arbutus, Garry oak/Douglas-fir, Arbutus/Douglas-fir).

Areas with general biodiversity values

FS — **Seasonally flooded agricultural field**

SG — **Second growth forest**
Forested ecosystem with dominant age class 60 - 100 years; coniferous (co), mixed with broadleaf component > 15% (mx).

Other Symbols

Secondary ecosystem
Indicates the presence of a secondary ecosystem; *see table below for further details.*

125 — Air photo identification number
Location of photo center
BCB92141 — Air photo flight line identification

Municipal boundary
Regional District boundary
Sensitive Ecosystems Inventory study area boundary
Road

Ecosystem Classifications for Sites in the Bowen/Gambier Trust Areas

See legend above for the description of the ecosystem codes
** Site visited, classification verified, additional information available*
+ Site visited, classification verified only

Site No.	Primary Ecosystem	Secondary Ecosystem
H1706	WD	CB
H1707	WD	HT:ro
H1708	CB	WD
H1710	HT:ro	SG:co
H1711	SG:co	
H1712	HT:ro	SV:cl, SGco
H1713	OF:co	
H1714	HT:ro	SG:co
H1714A	RI:5, 6, 7	OF:co
H1714B	RI:4, 5	SG:mx
* H1715	OF:co	
* H1716	WN:ms	
H1716A	RI:4, 5	SG:mx
H1717	CB	SG:co
H1718	HT:ro	SG:co
H1719	SG:co	
H1721	CB	OF:co
H1723	CB	
H1724	SG:co	OF:co
H1726	OF:co	SG:co
H1727	OF:co	
H1728	HT:ro	
H1729	HT:ro	SG:co
H1730	HT:ro	SG:co
H1731	OF:co	SG:co
H1732	SG:co	HT:ro
H1733	SG:co	HT:ro
H1734	WN:sp	
* H1735	WN:fn	
H1735A	RI:4, 5	
H1735B	OF:co	RI:5:6
H1735C	RI:5, 6	
H1738	WN	
H1738A	HT:ro	SG:co
H1738B	HT:ro	SG:co
H1738C	SG:mx	
H1741	SV	CB
H1742	SG:mx	
H1743	CB	
H1744	CB	
H1745	CB	WD
H1747	CB	
H1748	CB	SG
H1749	HT:ro	
H1750	HT:ro	
H1751	SG:co	HT:ro
H1752	SG:co	HT:ro
* H1753	SG:mx	OF:co
H1754	SG:co	
H1755	HT:ro	SG:co
H1756	HT:ro	SG:co
H1757	OF:co	
H1757A	HT:ro	SG:co
H1757B	RI:4, 5, 6	
H1757C	HT:ro	SG:co
* H1758A	WN:ms	
* H1758B	WN:ms	
H1759	SG:co	HT:ro
H1760	SG:co	HT:ro
* H1761	RI:7:6:5	
H1761A	RI:5:4	
H1762	HT:ro	SG:co
H1763	SG:co	HT:ro
H1764	SG:co	HT:ro
H1765	WN:ms	
H1766	SG:co	
+ H1767	WN:fn	
H1767A	HT:ro	SG:co
H1767B	HT:ro	SG:co
H1767C	OF:co	
* H1768	WN:ms	
H1768A	HT:ro	SG:co
H1768B	HT:ro	SG:co
H1769	CB	
H1770	HT:ro	SG:co
H1771	HT:ro	SG:co
H1772	SG:co	HT:ro
H1773	HT:ro	SG:co
H1774	SG:co	HT:ro
H1775	SG:co	HT:ro
H1776	CB	
H1776A	OF:co	
H1777	HT:ro	SG:co
H1778	HT:ro	SG:co
H1779	CB	
H1780	CB	
H1780A	CB	
* H1781A	CB	
* H1782	SG:co	
H1783	CB	
H1783A	OF:co	
H1783B	HT:ro	SG:co
H1783C	SG:co	
H1784	CB	
H1785	CB	
H1785A	OF:co	
H1786	CB	
H1786A	HT:ro	SG:co
H1786B	HT:ro	SG:co
H1787	CB	
H1788	CB	
H1789	CB	
H1790	SG:co	HT:ro
H1790A	SG:co	HT:ro
H1791	SG:co	HT:ro
H1792	HT:ro	SG:co
H1793	WN:sw	
H1794	CB	
H1795	CB	
H1796	CB	
H1797	SG:co	HT:ro
H1798	SG:co	OF:co
H1799	SG:co	HT:ro
H1800	HT:ro	
H1801	SG:co	HT:ro
H1802	SG:co	HT:ro
H1803	HT:ro	
H1804	SG:co	HT:ro
H1805	SG:co	
H1806	SG:co	HT:ro, SVcl
H1807	SG:co	HT:ro, SVcl
H1808	HT:ro	SG:co, SVcl
H1809	CB	
H1810	HT:ro	SG:co, CB
H1811	OF:mx	
H1812	CB	
H1813	CB	
H1814	HT:ro	SG:co
H1815	SG:co	
H1816	HT:ro	SG:co
H1821	SG:co	OF:co
H1823	HT:ro	SV:cl
H1824	HT:ro	SV:cl
H1826	HT:ro	SV:cl
H1827	HT:ro	SV:cl
H1828	HT:ro	SV:cl
H1829	HT:ro:sh	SG:co
H1830	HT:ro:sh	SG:co
H1831	HT:ro	SV:cl
H1833	CB	

Site No.	Primary Ecosystem	Secondary Ecosystem
H1834	CB	
H1834A	OF:co	
H1835	HT:ro	SV:cl
H1836	CB	OF:co
H1837	CB	OF:co
H1838	CB	
H1839	SG:co	HT:ro
H1840	SG:co	HT:ro
H1840A	OF:co	
H1841	SG:co	HT:ro
H1842	CB	
H1843	CB	
H1843A	OF:co	HT:ro
H1844	SG:co	HT:ro
H1845	SG:co	HT:ro
H1846	HT:ro	
H1846A	OF:co	HT:ro
H1847	CB	
H1848	CB	
H1849	CB	
H1849A	OF:co	
H1850	CB	
H1850A	OF:mx	
H1851	HT:ro	
H1852	CB	
H1853	CB	
H1860	CB	WD
H1860A	SG:co	
H1861	CB	
H1862	CB	
H1863	CB	
H1865	CB	HT:ro
H1865A	SG:co	
H1866	SV:sp	
H1867	CB	
H1867A	SG:co	
H1868	CB	
H1869	CB	
H1870	CB	SG:co
* H1870A	SG:co	RI:5:6
H1871	CB	
H1872	CB	
H1872A	SG:mx	
H1873	CB	
H1874	CB	
H1875	CB	
H1876	SG:co	CB
* H1877	HT:ro	SG:co
H1877A	HT:ro	
H1877B	SG:co	OF:co
H1878	CB	
H1879	CB	
H1879A	OF:co	HT:ro
H1879B	SG:mx	
H1879C	SG:co	
H1879D	WN:sp	
H1880	CB	
H1881	SG:co	HT:ro
H1882	HT:ro	SG:co
H1883	HT:ro	SG:co
H1884	HT:ro	SG:co
H1885	HT:ro	
H1886	CB	
H1887	CB	
H1887A	CB	
+ H1888	CB	
* H1889	CB	WD
H1890	OF:co	
H1891	CB	
H1891A	OF:co	
H1892	CB	
+ H1892A	OF:mx	
H1892B	OF:co	
H1893	CB	
* H1894	CB	OF:co
H1896	CB	
H1896A	OF:co	
H1897	CB	
H1898	CB	
H1899	CB	
H1899A	OF:co	
H1900	CB	
H1901	CB	
H1902	CB	
H1903	CB	
H1904	CB	
H1904A	OF:co	HT:ro
H1904B	OF:mx	
* H1905	CB	
* H1905A	SG:mx	
H1906	CB	
H1907	CB	
* H1907A	OF:co	
H1908	CB	
* H1909	CB	
H1910	CB	
* H1910A	SG:co	
* H1910B	WD	HT
H1911	SG:co	
H1912	CB	
H1913	CB	
H1913A	CB	
H1914	CB	
H1916	SG:mx	
H1916A	SV:sp	
H1917	CB	
H1918	CB	
H1919	CB	
H1920	WD	CB
H1920A	CB	
H1920B	CB	
H1920C	CB	
H1921	CB	
H1922	CB	WD
H1923	CB	OF:co
H1924	CB	OF:co
H1925	CB	OF:co
H1926	CB	
H1926A	CB	
H1926B	CB	
H1926C	CB	
H1926D	WD	
H1926E	CB	
H1927	SG:mx	
H1927A	WN:sp	
* H1929	CB	
* H1930	CB	
H1930A	SV:sp	
H1931	CB	SG:co
H1932	HT:ro	SG:mx
* H1933	HT:ro	OF:co
* H1934	OF:co	SG:co
H1935	SG:co	HT:ro
H1936	HT:ro	SG:co
H1938	HT:ro	
* H1939	OF:co	SG:mx
H1940	SG:co	
H1941	SG:co	
H1942	CB	SG:co
* H1943	WN:ms	

Site No.	Primary Ecosystem	Secondary Ecosystem
* H1944	SG:co	
H1945	CB	
H1946	CB	
H1947	CB	
H1948	CB	SG:co
* H1949	CB	SG:co
H1950	SG:mx	
* H1951	SG:co	HT:ro
H1952	CB	
H1953	CB	
H1954	CB	
H1955	CB	WD
H1956	SG:co	HT:ro
* H1957	SG:mx	OF:co
H1958	HT:ro	
+ H1959	SG:mx	HT:ro
* H1960	SG:mx	HT:ro
H1961	CB	WD
H1962	CB	
H1963	CB	WD
H1964	CB	WD
H1964A	SG:co	
H1965	CB	
H1966	CB	
H1967	CB	WD
H1967A	CB:cl	
H1967B	SG:co	HT:ro
H1968	CB	
H1969	HT:sh:ro	
H1969A	HT:sh	
H1969B	RI:5, g	
H1970	HT:sh:ro	
H1970A	RI:5, g	
H1970B	HT:ro:sh	
H1970C	OF:mx	
H1971	HT:ro:sh	
* H1972	HT:ro:sh	
H1973	HT:ro:sh	
H1974	HT:ro:sh	
* H1975	HT:ro:sh	
H1975A	OF:mx	HT:ro
H1976	HT:ro:sh	
H1976A	HT:ro:sh	
H1976B	HT:ro:sh	
H1977	HT:ro:sh	
H1977A	RI:4, g	
H1977B	HT:sh:ro	
H1978	CB	
* H1978A	CB	
H1979	CB	
H1979A	WD	CB
H1980	CB	
H1981	CB	
H1981A	OF:mx	
H1981A	OF:mx	
H1981B	SG:mx	
* H1981C	WN:sp	
H1982	CB	
H1983	CB	
H1983A	CB:cl	
H1983B	WD	HT:ro
* H1983C	RI:5	
* H1983D	WN:ms	
* H1984	CB	
* H1984A	HT:ro	WD
* H1984B	HT:ro	WD
* H1984C	SG:co	
H1984D	WD	HT:ro
* H1985	WN:ms	
* H1985A	SG:mx	OF:co
H1985B	WN:ms	
* H1986	WN:ms	
* H1986A	RI:g	
* H1987	SG:co	HT:ro
H1987A	RI:6, g	
* H1988	WN:ms:sp	
H1988A	RI:4, 5, g	
H1988B	HT:ro	SG:co
* H1989	HT:ro	WD
H1989A	HT:ro	WD
H1989B	OF:co	
* H1990	HT:ro	WD
H1990A	SG:co:mx	
* H1991	WN:ms:sp	
H1992	SG:co	HT:ro
* H1993A	WN:ms:sp	
* H1993B	WN:ms	
* H1993C	WN:sp	
H1993D	SG:mx	
* H1994	SG:co	HT:ro
* H1995	WN:ms:sp	
* H1995A	RI:5, 6	
H1995B	RI:4, 5	
H1995C	RI:3, 4, 5	
* H1996	WN:sp	
H1997	SG:mx	OF:mx
* H1997A	RI:5, g	
* H1997B	WN:fn	
H1997C	RI:5, 6	WN:ms
H1999	CB	
H2000	CB	
H2001	CB	WD
H2003	WD	CB
H2003A	CB:cl	
H2004	CB	
H2004A	WD	CB:cl
H2005	CB:cl	
H2006	CB:cl	
H2006A	RI:5, 6	
H2007	WN:ms	
H2008	CB	
H2009	CB	
* H2010	CB	
H2010A	CB:cl	
H2011	CB	
H2011A	OF:co	
H2012	CB	
H2013	WD	CB
H2013A	RI:6	
* H2014	CB	
* H2015	CB	
H2016	CB	
H2017	CB	
H2018	CB	
H2019	OF:mx	
H2019A	HT:sh	
* H2020	SG:mx	HT:ro
H2021	HT:ro:sh	
H2022	SV:cl	HT:ro

Data Sources for Bowen/Gambier Trust Areas

Field visits

Initial groundtruthing was conducted during the summer of 1994. Additional field checking was performed in 1999, and an updated map set and database were produced.

Aerial photographs

Flight Number	Scale	Date flown
BC79052	1:20,000	June 26, 1979
BC86061	1:15,000	July 21, 1986
BCB90014	1:15,000	June 21, 1990
BCC90017	1:15,000	July 10, 1990
BCB90019	1:15,000	July 10, 1990
BCB90045	1:15,000	July 9, 1990

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