

Pillar Valley – A biodiversity hot-spot

A two week long fauna survey undertaken during late November – early December 2015, as part of the federally funded Upper Coldstream Biodiversity Project, has again confirmed the high concentrations of native species that the area supports.



A large part of the project area lies in the valley between Pillar Ridge and the Coast Range

Already more than 900 native plant species, including 18 threatened species, have been found, along with a further 25 species that are deemed rare or significant in NSW (*Sheringham and Westaway, 1995*).

As Project partners with the NSW Nature Conservation Council, volunteers from the Clarence Environment Centre have been involved in assisting with setting-up and monitoring of traps, and accompanying the highly experienced professional ecologists undertaking the survey.

That survey saw more than 1,000 Elliott trapping nights (aimed at capturing rodents, small lizards and the like), some 25 harp trap nights (designed specifically to catch micro-bats), and a number of cat traps (for larger fauna such as Quolls, Bettongs Possums and Bandicoots). Night time call play-back and spotlighting (for large forest Owls and Gliders), and frog surveys, along with opportunistic sightings of birds, snakes and other fauna, were also part of the focus.



Setting up a harp trap to capture micro bats

Call play-back and spotlighting, when weather conditions are favourable, began soon after 8pm and often continued until midnight. Then, to ensure the well-being of any captured animals, all traps had to be checked in the early morning, before the sun heats up, so the ecologists and some of the volunteers camped out at Pillar Valley rather than lose another hour's sleep driving to and from home.

Captured animals are coaxed from the Elliott trap into a plastic bag for identification, which can often be achieved by simply observing them in the bag. However, more closer inspection can only be done in the hand and this requires great care and dexterity on behalf of the handler.



Photographing a captured rodent for future reference is only required when a positive identification isn't possible.



Handling wild animals, even small rodents, requires skill to avoid hurting the creature or being bitten.

Identifying captured animals takes a lot of experience by the ecologists. In most cases identification can be done quickly once the animal is taken in hand and photographing, as shown above, can prove to be helpful in cases where a positive identification is not immediately possible. In those cases, a hair sample is clipped off and sent to a laboratory for analysis.

Details of each animal are recorded, including sex, and GPS location. In the case of threatened species, the animal is also weighed and measured, after which they are released to find their way home.

The treatment of micro bats is different as they cannot be released in daylight, so after identification, they are placed in a dark bag, kept cool and quiet, and then released at the same site that evening.



A Gould's Long-eared Bat, *Nyctophilus gouldi*, one of more than 20 microbat species known to occur on NSW north coast



The tricky process of identifying microbats

The identification of some microbat species can be extremely tricky with precise measurements and close examination required to make a positive ID

Night-time surveys are undertaken using call play-back, where recorded calls of selected nocturnal animals and birds are played over a loud-speaker, inviting a response, which is not always what might be expected. For example, playing Yellow-bellied Glider calls at one site failed to get any response. However, playing a Powerful Owl call a few minutes later resulted in multiple glider calls as the panic-stricken animals reacted to the perceived danger. A few minutes later, an alert ecologist spotted a Powerful Owl which had silently flown in to check out what it believed to be an unwelcome interloper.

Opportunistic sightings are an important component of any fauna survey, at right a Tawny Frogmouth, intent on spotting a tasty beetle from its perch on a gatepost, is interrupted by the spotlight.



A Tawny Frogmouth interrupted in its foraging



The Small-eyed Snake is harmless to humans despite its aggressive striking when it senses danger

A mildly venomous Small-eyed Snake likewise foraging for small insects slithers for cover. It is one of those species whose venom is produced from fangs that are set too far back in its mouth to prove dangerous to large mammals.



A White-throated Nightjar

A non-venomous Carpet Snake might not have a fatal bite, but its ability to



The Carpet Snake, NSW's largest snake (photo courtesy D. Milledge).

constrict its prey is extremely powerful, and with a length of up to 4m, it can be a snake to reckon with.

And at left the reflection from the eye of a White-throated Nightjar is picked up by the spotlight.

Significant finds by the survey included rodents, New Holland Mouse and Pale Field Rat; the vulnerable Brush-tailed Phascogale, Rufous Bettong and Grey-headed Flying fox, and micro-bats – the Little Bentwing, and Eastern Long-eared Bats.



The Federal vulnerable New Holland Mouse (photo courtesy Pat Edwards)



Pale Field Rat



The Vulnerable Eastern Long-eared Bat (photo courtesy Jan Taylor)



Common scaly-foot - *Pygopus lepidopodus* (photo courtesy Jan Taylor)

Appendix A

Rare and threatened fauna of the Upper Coldstream Biodiversity Project area. (All project records since 2014)

Animals

Common Name	Scientific Name	Family	Status and comments
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	<i>Dasyuridae</i>	Vulnerable
Eastern Long-eared Bat	<i>Nyctophilus bifax</i>	<i>Vespertilionidae</i>	Vulnerable
Grey-headed Flying Fox	<i>Pteropus poliocephalus</i>	<i>Pteropodidae</i>	Vulnerable
Little Bent-wing Bat	<i>Miniopterus australis</i>	<i>Vespertilionidae</i>	Vulnerable
New Holland Mouse	<i>Pseudomys novaehollandiae</i>	<i>Muridae</i>	Vulnerable (EPBC Act)
Pale Field Rat	<i>Rattus tunneyi</i>	<i>Muridae</i>	Rare
Rufous Bettong	<i>Aepyprymnus rufescens</i>	<i>Potoroidae</i>	Vulnerable
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	<i>Dasyuridae</i>	Vulnerable
Squirrel Glider	<i>Petaurus norfolcensis</i>	<i>Petauridae</i>	Vulnerable
Yellow-bellied Glider	<i>Petaurus australis</i>	<i>Petauridae</i>	Vulnerable

Birds

Australasian Grebe	<i>Tachybaptus novaehollandiae</i>	<i>Podicipedidae</i>	Vulnerable
Black Bittern	<i>Ixobrychus poiciloptilus</i>	<i>Ardeidae</i>	Vulnerable
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>	<i>Ciconiidae</i>	Endangered
Brolga	<i>Grus rubicundus</i>	<i>Gruidae</i>	Vulnerable
Coastal Emu	<i>Dromaius novaehollandiae</i>	<i>Dromaiidae</i>	Endangered population
Glossy-black Cockatoo	<i>Calyptorhynchus lathamii</i>	<i>Cacatuinae</i>	Vulnerable
Grey-crowned Babbler	<i>Pomatostomus temporalis</i>	<i>Timaliidae</i>	Vulnerable
Little Lorikeet	<i>Glossopsitta pusilla</i>	<i>Loriinae</i>	Vulnerable
Magpie Goose	<i>Anseranus semipalmata</i>	<i>Anatidae</i>	Vulnerable
Powerful Owl	<i>Ninox strenua</i>	<i>Strigidae</i>	Vulnerable
Spotted Harrier	<i>Circus assimilis</i>	<i>Accipitridae</i>	Vulnerable
Varied Sittella	<i>Daphoenositta chrysoptera</i>	<i>Neosittidae</i>	Vulnerable
Wompoo Fruit-Dove	<i>Ptilinopus magnificus</i>	<i>Columbidae</i>	Vulnerable

Reptiles

White-crowned Snake	<i>Cacophis harriettae</i>	<i>Elapidae</i>	Vulnerable
Pale-headed Snake	<i>Hoplocephalus bitorquatus</i>	<i>Elapidae</i>	Vulnerable (Not a positive ID)
Stephens' Banded Snake	<i>Hoplocephalus stephensii</i>	<i>Elapidae</i>	Vulnerable

Invertebrates

Coastal Petaltail Dragonfly	<i>Petaleura litorea</i>		Endangered
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Appendix B

Rare and threatened flora of the Upper Coldstream Biodiversity Project area. (All project records since 2014)

Significant flora of the NSW North Coast

Scientific name	Common name	Family	Status
<i>Acmella grandiflora</i>		<i>Asteraceae</i>	Rare in NSW, new southern limit
<i>Ancistrachne maidenii</i>		<i>Poaceae</i>	Vulnerable
<i>Angophora robur</i>	Broad-leaved Sandstone Apple	<i>Myrtaceae</i>	Vulnerable
<i>Aristida queenslandica</i>	A Spear Grass	<i>Poaceae</i>	Regionally uncommon
<i>Artanema fimbriatum</i>		<i>Scrophulariaceae</i>	Rare in NSW
<i>Arthraxon hispidus</i>	Hairy Joint Grass	<i>Poaceae</i>	Vulnerable
<i>Arthrochilus prolixus (irritabilis)</i>	Elbow Orchid	<i>Orchidaceae</i>	NP Act Protected. Regionally uncommon
<i>Australorchis monophylla</i>	Lily-of-the-Valley Orchid	<i>Orchidaceae</i>	NP Act Protected – Southern limit
<i>Belvisia mucronata</i>	Rat's Tail fern	<i>Polypodiaceae</i>	Endangered – Southern range extension
<i>Bossiaea scortechinii</i>		<i>Faboideae</i>	Regionally rare
<i>Buchnera gracilis</i>		<i>Scrophulariaceae</i>	Regionally uncommon
<i>Bursaria cayzeriae</i>		<i>Pittosporaceae</i>	Endemic to Clarence. Recently described
<i>Callistemon linearis</i>	Narrow-leaved Bottlebrush	<i>Myrtaceae</i>	Regionally uncommon
<i>Callistemon rigidus</i>	Stiff Bottlebrush	<i>Myrtaceae</i>	Regionally uncommon
<i>Carex brownii</i>		<i>Cyperaceae</i>	Regionally uncommon
<i>Cassytha racemosa</i>		<i>Lauraceae</i>	ROTAP (rare in NSW)
<i>Centipeda cunninghamii</i>	Common Sneezeweed	<i>Asteraceae</i>	Regionally uncommon
<i>Chiloglottis diphylla</i>	Common Wasp Orchid	<i>Orchidaceae</i>	NP Act Protected, Regionally rare
<i>Chorizema parviflora</i>	Eastern Flame Pea	<i>Fabaceae</i>	Uncommon
<i>Corybas barbarae</i>	Fairy Lanterns	<i>Orchidaceae</i>	NP Act Protected. Rare in NSW
<i>Corynocarpus rupestris</i> subsp <i>rupestris</i>	Glenugie Karaka	<i>Corynocarpaceae</i>	Vulnerable
<i>Cryptandra longistaminea</i>		<i>Rhamnaceae</i>	Regionally rare
<i>Cryptocarya floydii</i>	Gorge Laurel	<i>Lauraceae</i>	Rare
<i>Eucalyptus psammitica</i>	Sandstone Mahogany	<i>Myrtaceae</i>	ROTAP
<i>Eucalyptus rummeryi</i>	Steel Box	<i>Myrtaceae</i>	ROTAP
<i>Eucalyptus tetrapleura</i>	Square-fruited Ironbark	<i>Myrtaceae</i>	Vulnerable
<i>Geodorum terrestre</i>	Shepherd's Crook Orchid	<i>Orchidaceae</i>	Endangered
<i>Glochidion ferdinandi</i> var <i>pubens</i>	Hairy Cheese Tree	<i>Euphorbiaceae</i>	Not common
<i>Hygrophila angustifolia</i>		<i>Acanthaceae</i>	New Southern limit
<i>Keraudrenia corollata</i> var <i>denticulata</i>		<i>Sterculiaceae</i>	Rare
<i>Lindernia alsinoides</i>	Noah's False Chickweed	<i>Scrophulariaceae</i>	Endangered
<i>Lindsaea fraseri</i>		<i>Lindsaeaceae</i>	Endangered
<i>Marsdenia longiloba</i>	Slender Marsdenia	<i>Asclepiadaceae</i>	Endangered
<i>Maundia triglochinosides</i>		<i>Juncaginaceae</i>	Vulnerable
<i>Melaleuca tamariscina</i> subsp <i>irbyana</i>	Weeping Teatree	<i>Myrtaceae</i>	Endangered
<i>Melichrus hirsutus</i>	Hairy Melichrus	<i>Ericaceae/Styphelioideae</i>	Endangered
<i>Melodorum leichhardtii</i>	Zig Zag Vine	<i>Annonaceae</i>	Uncommon
<i>Oberonia complanata</i>	Southern Green Fairy Orchid	<i>Orchidaceae</i>	Endangered
<i>Olearia stillwelliae</i>		<i>Asteraceae</i>	ROTAP
<i>Persicaria dichotoma</i>	A Knotweed	<i>Polygalaceae</i>	Rare in NSW (Flora of NSW)
<i>Petalochilus pictus</i>	Painted Fingers	<i>Orchidaceae</i>	NP Act Protected. Regionally uncommon
<i>Petalochilus quadrifarius</i>	Large Pink Fingers	<i>Orchidaceae</i>	NP Act Protected. Rare in NSW
<i>Quassia</i> sp 'Moonie Creek'		<i>Simaroubaceae</i>	Endangered
<i>Rotala tripartita</i>		<i>Lythraceae</i>	Endangered
<i>Sauropus hirtellus</i>		<i>Euphorbiaceae</i>	Uncommon
<i>Sida cordifolia</i>		<i>Malvaceae</i>	ROTAP
<i>Tetrabaculum melaleucaphilum</i>	Flared Tree Spider Orchid	<i>Orchidaceae</i>	Endangered
<i>Tylophora woollsii</i>	Wooll's Tylophora	<i>Apocynaceae</i>	Endangered
<i>Viola silicestris</i>		<i>Violaceae</i>	Newly described
<i>Zornia floribunda</i>		<i>Faboideae</i>	Uncommon, Grafton & Bingara

Other flora protected under the National Parks and Wildlife Act

Scientific name	Common name	Family
<i>Acianthus fornicatus</i>	Pixie Caps	<i>Orchidaceae</i>
<i>Adelopetalum exiguum</i>	Tiny Strand Orchid	<i>Orchidaceae</i>
<i>Adiantum aethiopicum</i>	Common Maidenhair Fern	<i>Adiantaceae</i>
<i>Adiantum formosum</i>	Giant Maidenhair Fern	<i>Adiantaceae</i>
<i>Adiantum hispidulum</i>	Rough Maidenhair	<i>Adiantaceae</i>

Scientific name	Common name	Family	Status
<i>Archontophoenix cunninghamiana</i>	Bangalow Palm		<i>Arecaceae</i>
<i>Asplenium australasicum</i>	Birds Nest Fern		<i>Aspleniaceae</i>
<i>Banksia spinulosa</i> var. <i>collina</i>	Hairpin Banksia		<i>Proteaceae</i>
<i>Boronia polygalyfolia</i>			<i>Rutaceae</i>
<i>Caleana major</i>	Large Duck Orchid		<i>Orchidaceae</i>
<i>Calochilus paludosus</i>	Red Beard Orchid		<i>Orchidaceae</i>
<i>Calochilus paludosus</i>	Red Beard Orchid		<i>Orchidaceae</i>
<i>Carex gaudichaudiana</i>			<i>Cyperaceae</i>
<i>Casuarina cunninghamii</i>	River Sheoak		<i>Casuarinaceae</i>
<i>Caustis blakei</i>			<i>Cyperaceae</i>
<i>Caustis flexuosa</i>	Curly Wig		<i>Cyperaceae</i>
<i>Ceratupetalum gummiferum</i>	NSW Christmas Bush		<i>Cunoniaceae</i>
<i>Chiloglottis sylvestris</i>	Small Wasp Orchid		<i>Orchidaceae</i>
<i>Cordyline stricta</i>	Narrow-leaved Palm Lily		<i>Asteliaceae</i>
<i>Corysanthes fimbriata</i>	Fringed Helmet Orchid		<i>Orchidaceae</i>
<i>Cryptostylis erecta</i>	Bonnet Orchid		<i>Orchidaceae</i>
<i>Cryptostylis subulata</i>	Large Tongue Orchid, Cow Orchid		<i>Orchidaceae</i>
<i>Cyathea australis</i>	Rough Treefern		<i>Cyatheaceae</i>
<i>Cyathea cooperi</i>	Straw Treefern		<i>Cyatheaceae</i>
<i>Cyathea leichhardtiana</i>	Prickly Treefern		<i>Cyatheaceae</i>
<i>Cymbidium canaliculatum</i>	Tiger orchid		<i>Orchidaceae</i>
<i>Cymbidium suave</i>	Snake Orchid		<i>Orchidaceae</i>
<i>Davallia solida</i> var. <i>pyxidata</i>	Hare's Foot Fern		<i>Davalliaceae</i>
<i>Diplodium grandiflorum</i>	Cobra Greenhood		<i>Orchidaceae</i>
<i>Dipodium pulchellum</i>	A Hyacinth Orchid		<i>Orchidaceae</i>
<i>Dipodium variegatum</i>	Slender Hyacinth Orchid		<i>Orchidaceae</i>
<i>Diuris sulphurea</i>	Tiger Orchid		<i>Orchidaceae</i>
<i>Dockrillia linguiformis</i>	Tongue Orchid		<i>Orchidaceae</i>
<i>Dockrillia teretifolia</i>	A Rat's-tail Orchid		<i>Orchidaceae</i>
<i>Epipogium roseum</i>	Ghost Orchid		<i>Orchidaceae</i>
<i>Gahnia sieberiana</i>	Red-fruit Saw Sedge		<i>Cyperaceae</i>
<i>Glossodia major</i>	Waxlip Orchid		<i>Orchidaceae</i>
<i>Livistona australis</i>	Cabbage Palm		<i>Arecaceae</i>
<i>Lomatia silaifolia</i>	Crinkle Bush		<i>Proteaceae</i>
<i>Macrozamia fawcettii</i>			<i>Zamiaceae</i>
<i>Microtis unifolia</i>	Common Onion Orchid		<i>Orchidaceae</i>
<i>Oxycephala shepherdii</i>	Wheat-leaf Rope Orchid		<i>Orchidaceae</i>
<i>Persoonia stradbrogensis</i>	Geebung		<i>Proteaceae</i>
<i>Persoonia tenuifolia</i>	Prickly Geebung		<i>Proteaceae</i>
<i>Petalochilus carneus</i>	Pink Fingers		<i>Orchidaceae</i>
<i>Petalochilus catenatus</i>	White Fingers		<i>Orchidaceae</i>
<i>Petrophile canescens</i>	Prickly Conesticks		<i>Proteaceae</i>
<i>Petrophile pulchella</i>	Conestick		<i>Proteaceae</i>
<i>Phebalium woombye</i>	Wallum Phebalium		<i>Rutaceae</i>
<i>Platycterium bifurcatum</i>	Elk Horn		<i>Polypodiaceae</i>
<i>Platycterium superbum</i>	Stag Horn		<i>Polypodiaceae</i>
<i>Pterostylis acuminata</i>	Pointed Greenhood		<i>Orchidaceae</i>
<i>Pterostylis curta</i>	Blunt Greenhood		<i>Orchidaceae</i>
<i>Pterostylis baptistii</i>	King Greenhood		<i>Orchidaceae</i>
<i>Pterostylis hispidula</i>	Small Nodding Greenhood		<i>Orchidaceae</i>
<i>Pterostylis nutans</i>	Nodding Greenhood		<i>Orchidaceae</i>
<i>Pterostylis oblonga</i>	Coastal Maroonhood		<i>Orchidaceae</i>
<i>Restio tetraphyllum</i>			<i>Restionaceae</i>
<i>Sannantha angusta</i>			<i>Myrtaceae</i>
<i>Sannantha collina</i>			<i>Myrtaceae</i>
<i>Sannantha similis</i>			<i>Myrtaceae</i>
<i>Sarcochilus hillii</i>			<i>Orchidaceae</i>
<i>Spiranthes sinensis</i>	Australian Lady's Tresses		<i>Orchidaceae</i>
<i>Sticherus flabellatus</i>	Umbrella Fern		<i>Gleicheniaceae</i>
<i>Tetrabaculum tetragonum</i>	Banded Tree Spider Orchid		<i>Orchidaceae</i>
<i>Thelychiton gracilicaulis</i>	Blotched Cane Orchid		<i>Orchidaceae</i>
<i>Thelychiton kingianus</i>	Pink Rock Orchid		<i>Orchidaceae</i>
<i>Thelychiton speciosus</i>	Rock Lily		<i>Orchidaceae</i>
<i>Thelymitra pauciflora</i>	Slender Sun Orchid		<i>Orchidaceae</i>
<i>Todea barbara</i>	King Fern		<i>Osmundaceae</i>
<i>Tropilis aemula</i>	Ironbark Orchid		<i>Orchidaceae</i>
<i>Tropilis radiata</i>	Brush Box Feather Orchid		<i>Orchidaceae</i>
<i>Xanthorrhoea fulva</i>	A Grass Tree		<i>Xanthorrhoeaceae</i>
<i>Xanthorrhoea johnsonii</i>	A Grass Tree		<i>Xanthorrhoeaceae</i>
<i>Xanthorrhoea latifolia</i>	A Grass Tree		<i>Xanthorrhoeaceae</i>
<i>Xanthorrhoea macronema</i>	A Grass Tree		<i>Xanthorrhoeaceae</i>
<i>Xylomelum pyriforme</i>	Woody Pear		<i>Proteaceae</i>