



ANNE CLEMENTS & ASSOCIATES PTY. LIMITED
(ABN 41 077 242 365, ACN 077-160-939)
Environmental and Botanical Consultants

[REDACTED]

8 October 2020

[REDACTED] al Co Pty Ltd
Wallacia 2745
Email: [REDACTED]

RE: Biodiversity response to the Draft Cumberland Plain Conservation Plan

**Brief review of native vegetation on the property at [REDACTED] Wallacia
(Lot [REDACTED] and its conservation value**

Summary

For the approximately 45 ha Paddock F of the approximately 130 ha farming property at [REDACTED] Wallacia (Lot [REDACTED]) to be included as *Strategic Conservation Area*, it would require:

- a change of land use; and
- in my professional opinion, considerable restoration effort.

Unlike the nominated areas for development, the selection of *Strategic Conservation Area* is not based on current survey data.

Details

This farming property is owned by Elizabeth Park Pastoral Co Pty Ltd. It is located within both Penrith and Liverpool LGAs and is to the west of the Nancy Bird-Walton Airport. The mapping associated with the *Draft Cumberland Plain Conservation Plan* (The Plan) shows approximately 45 ha in the south of this property mapped as "*Strategic Conservation Area*" (Figures 1a, 1b-1, 1b-2, 1b-3).

The Plan is "*to protect Western Sydney's biodiversity and support its growth to 2056 and beyond*". From the Plan:

The strategic conservation area represents areas of important biodiversity value to the Cumberland subregion. These areas include large remnants of native vegetation, areas with important connectivity across the landscape, and some areas with ecological restoration potential. The strategic conservation area has been identified as the area of greatest strategic value to deliver long-term conservation outcomes in the Cumberland subregion and which can offset for biodiversity impacts.

As a restoration ecologist with more than 25 years experience, an Ecology Specialist Certified Environmental Practitioner (CEnvP Registration Number E200001) and a certified BAM Assessor (Accreditation Number: BAAS17088) (brief CV is in Appendix 1), I have reviewed the extent of native vegetation and conservation value on the mapped *Strategic Conservation Area* of the property on behalf of Joe Stambe of Elizabeth Park Pastoral Co Pty Ltd.

The property is not within a mapped 'growth area' or a 'nominated area' for development in Western Sydney. Open Line & Biosis (2020) points out that:

New surveys were undertaken within the nominated areas in accordance with the BAM and Terms of Reference. Surveys were completed between 2017 and 2019 ...

Outside the nominated areas, data and mapping of vegetation, TECs and species habitat is based on existing vegetation maps and species records. No surveys were undertaken outside the nominated areas.

As shown on the spatial viewer, The *Strategic Conservation Area* mapping incorporates some of *NSW Threatened Ecological Community* polygons. The *NSW Threatened Ecological Community* mapping appears to be based on the *Remnant Vegetation of the western Cumberland subregion* mapping VIS_ID 4207 (Figure 2a). Areas in the vicinity of the property, such as to the west, are mapped as a continuum on the *NSW Threatened Ecological Community* map, but are not included in the *Strategic Conservation Area* (Figures 1c-1, 1c-2, 2a).

Since early European settlement, the native vegetation cover on the clay soils of the western Sydney region have been cleared, farmed and at times regrown (Hazelton and Clements 2011). The 130 ha property has a long-history of ongoing active management as productive farming land. In the south of this property, Paddock F mapped as *Strategic Conservation Area*, is currently improved pasture for grazing. From my site inspection on 1 October 2020, the clay soil was ploughed, fertilised and over-sown with exotic pasture grasses with little resemblance to a native understorey (see geology, soil landscape, historical aerial photographs, vegetation mapping, and current farming activities including fertilising on Figures 2a, 2b, 2c, 3a, 3b, 4-2020 to 4-1970, 5, Table 1).

Considerations of *Strategic Conservation Area* in the final Plan

Prior to inclusion of the approximately 45 ha Paddock F as *Strategic Conservation Area* in the final Plan, it is recommended that:

- it is objectively assessed as to whether this 45 ha of is "*of greatest strategic value to deliver long-term conservation outcomes in the Cumberland subregion and which can offset for biodiversity impacts*" rather than, say, the mapped continuum of Threatened Ecological Community to the west of the property and south of the existing Crossman Reserve on Jerrys Creek; and
- the current conservation value of the 45 ha be objectively assessed and compared using the Biodiversity Assessment Method (BAM) (OEH 2017) with Vegetation Integrity Scores of the Native Vegetation calculated from data collected in Plots and analysed using the online BAM Calculator.

In conclusion

The approximately 45 ha Paddock F is part of a productive farming property. For its inclusion as *Strategic Conservation Area* in the final Plan, it would require a change of land use and in my professional opinion considerable restoration effort.

References

Benson DH (1992) The natural vegetation of the Penrith 1:100 000 map sheet. *Cunninghamia* 2(4), 541-596.

Hazelton P. and Clements A. (2011) Historic and Environmental Significance of Ecological Communities in NSW, Australia. *International Journal of Heritage and Sustainable Development*. 1(1), 72-83. ISSN: 1647-4112.

NSW Department of Planning, Industry and Environment (2020) *Draft Cumberland Plain Conservation Plan 2020–56*. (The Plan). Dated August 2020.

Office of Environment and Heritage (OEH) (2017) *Biodiversity Assessment Method*. Office of Environment and Heritage for the NSW Government. Dated 25 August 2017.

Open Line & Biosis (2020) *Draft Cumberland Plain Assessment Report. Summary Report*. Prepared for the NSW Government Department of Planning, Industry and Environment. Dated August 2020.

Tozer M (2003) The native vegetation of the Cumberland Plain, western Sydney: systematic classification and field identification of communities. *Cunninghamia* 8(1) 1-75.

Figures

- 1a Site boundary overlaid on Figure 3 of the Plan.
- 1b-1 Site boundary overlaid on the Figure 12 of the Plan.
- 1b-2 Site boundary overlaid on the Strategic Conservation Area shown in the Draft Cumberland Plain Conservation Plan, Spatial Viewer.
- 1b-3 Site boundary overlaid on the Strategic Conservation Area shown in the Draft Cumberland Plain Conservation Plan, Spatial Viewer - close up.
- 1c-1 Site boundary overlaid on "NSW Threatened Ecological Community" shown in the Draft Cumberland Plain Conservation Plan, Spatial Viewer. -
- 1c-2 Site boundary and Strategic Conservation Area overlaid on the NSW Threatened Ecological Community shown in the Draft Cumberland Plain Conservation Plan, Spatial Viewer - close up.
- 2a Site boundary overlaid on Remnant Vegetation of the western Cumberland subregion 2013 update VIS_ID4207.
- 2b Site boundary overlaid on vegetation mapping of NPWS (2002)/Tozer (2003) based on 1997/1998 aerial photographs.
- 2c Site boundary overlaid on vegetation mapping of Benson (1992) based on 1979 and updated using the 1988/1989 aerial photographs.
- 3a Site boundary overlaid on the Penrith 1:100,000 geological map.
- 3b Site boundary overlaid on the Soil Landscapes of the Penrith 1:100,000 sheet (Bannerman and Hazelton 1990).
- 4 Areas with canopy cover overlaid on historic aerial photographs dated 1970, 1978, 1989, 1991, 1994, 1998, 2020.
- 5 Site boundary and Paddock Plan overlaid on the Nearmap aerial photograph dated 05 August 2020

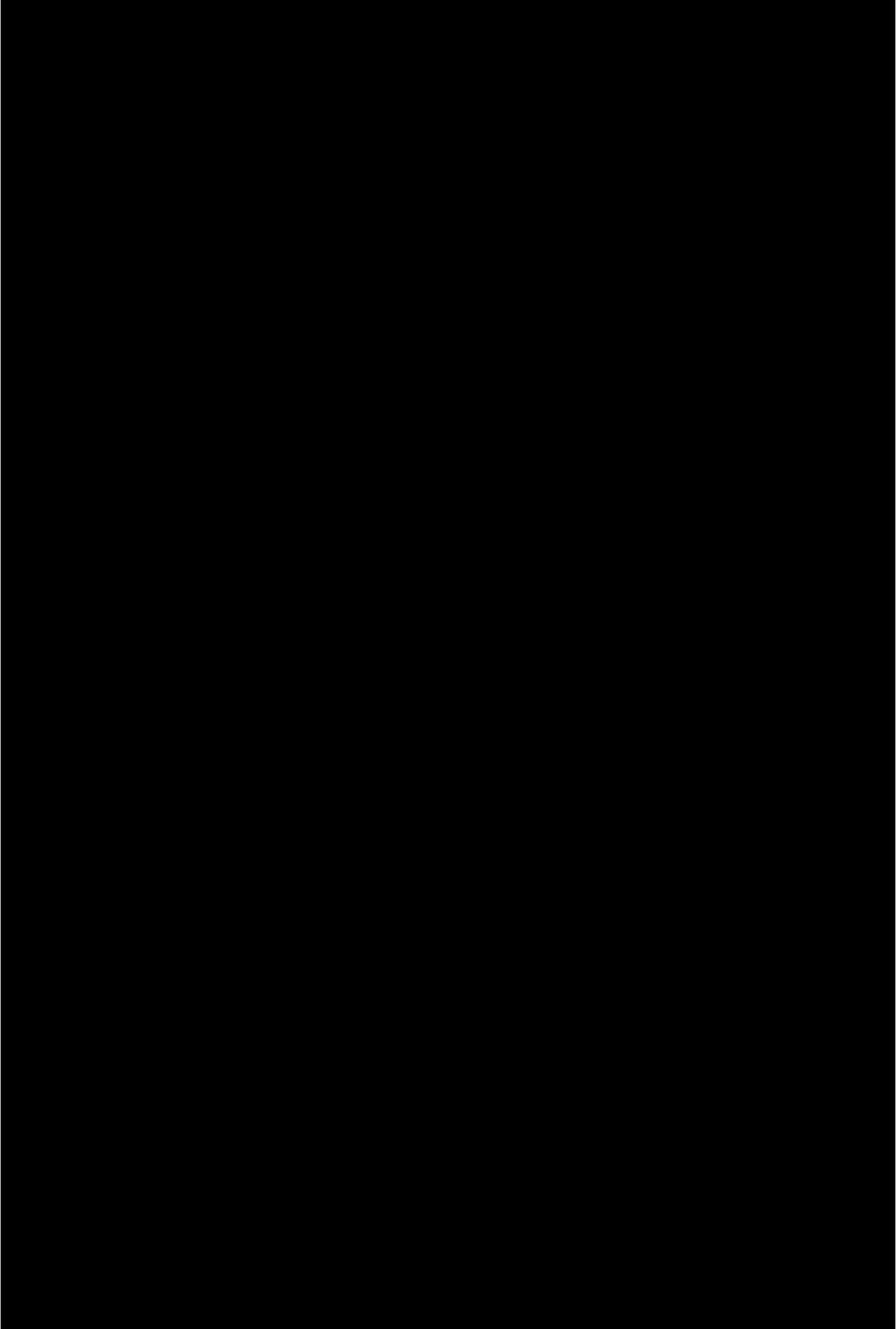
Tables

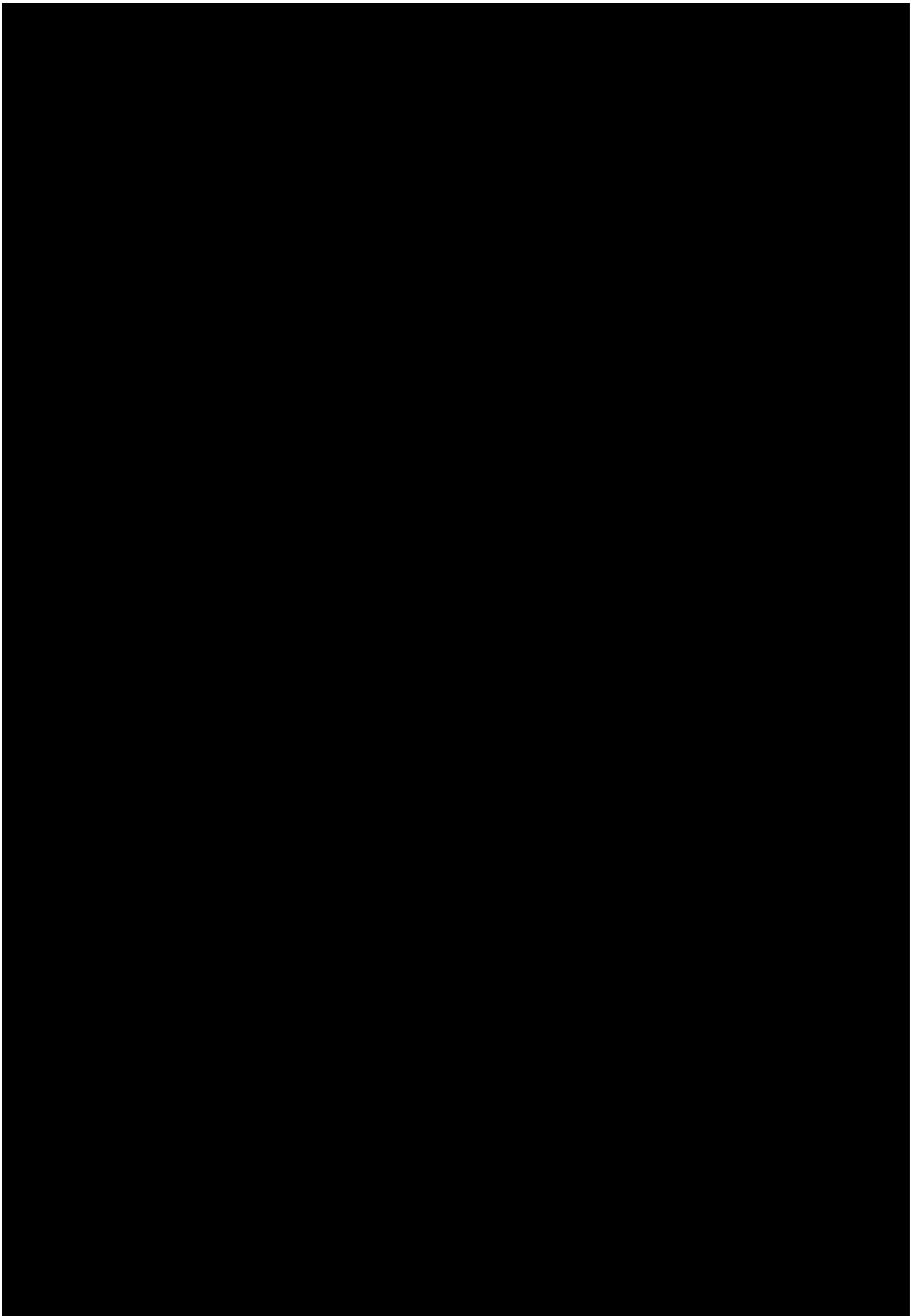
- 1 Changes in canopy cover over time in Paddock F (see Figures 4, 5)

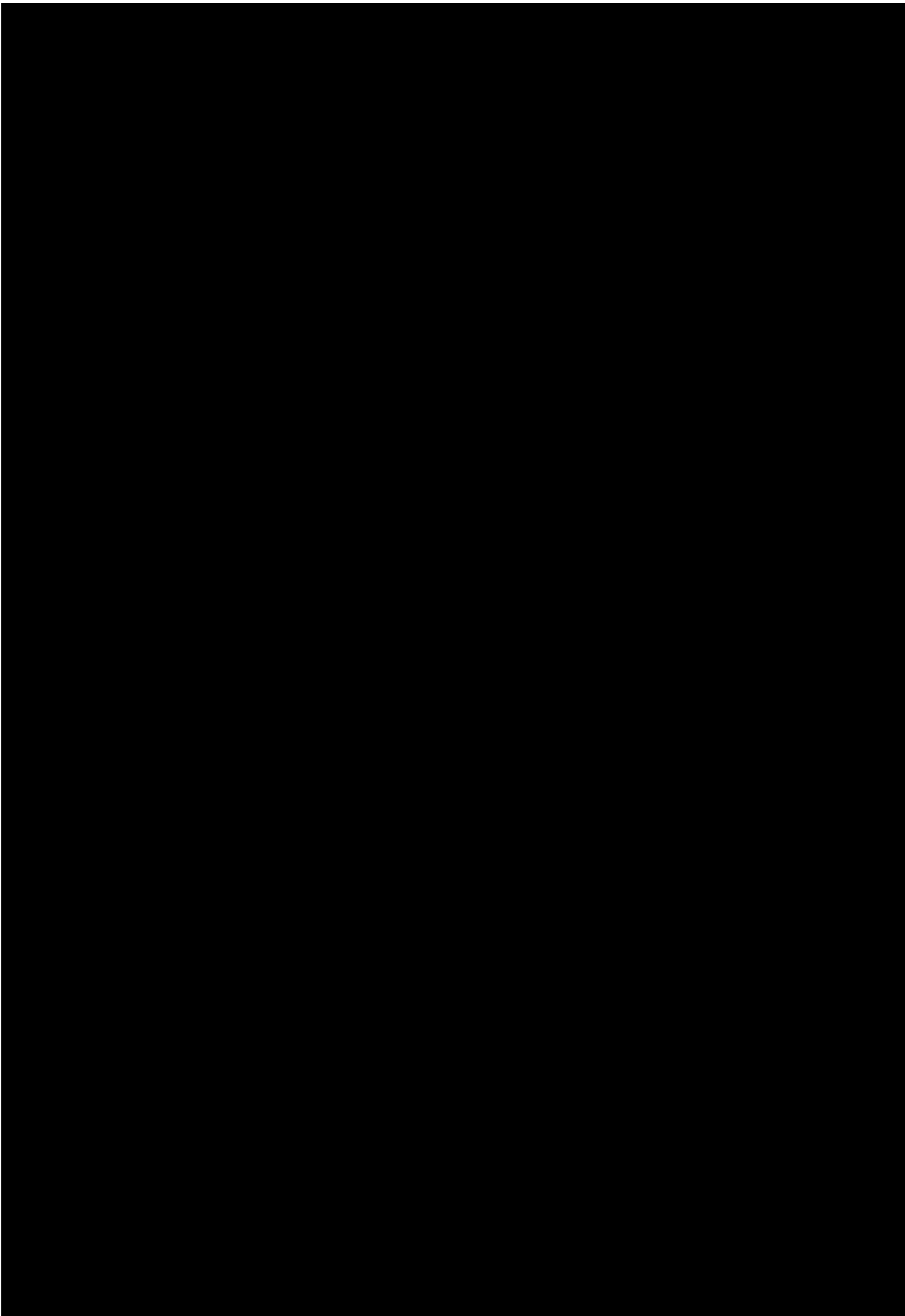
Appendices

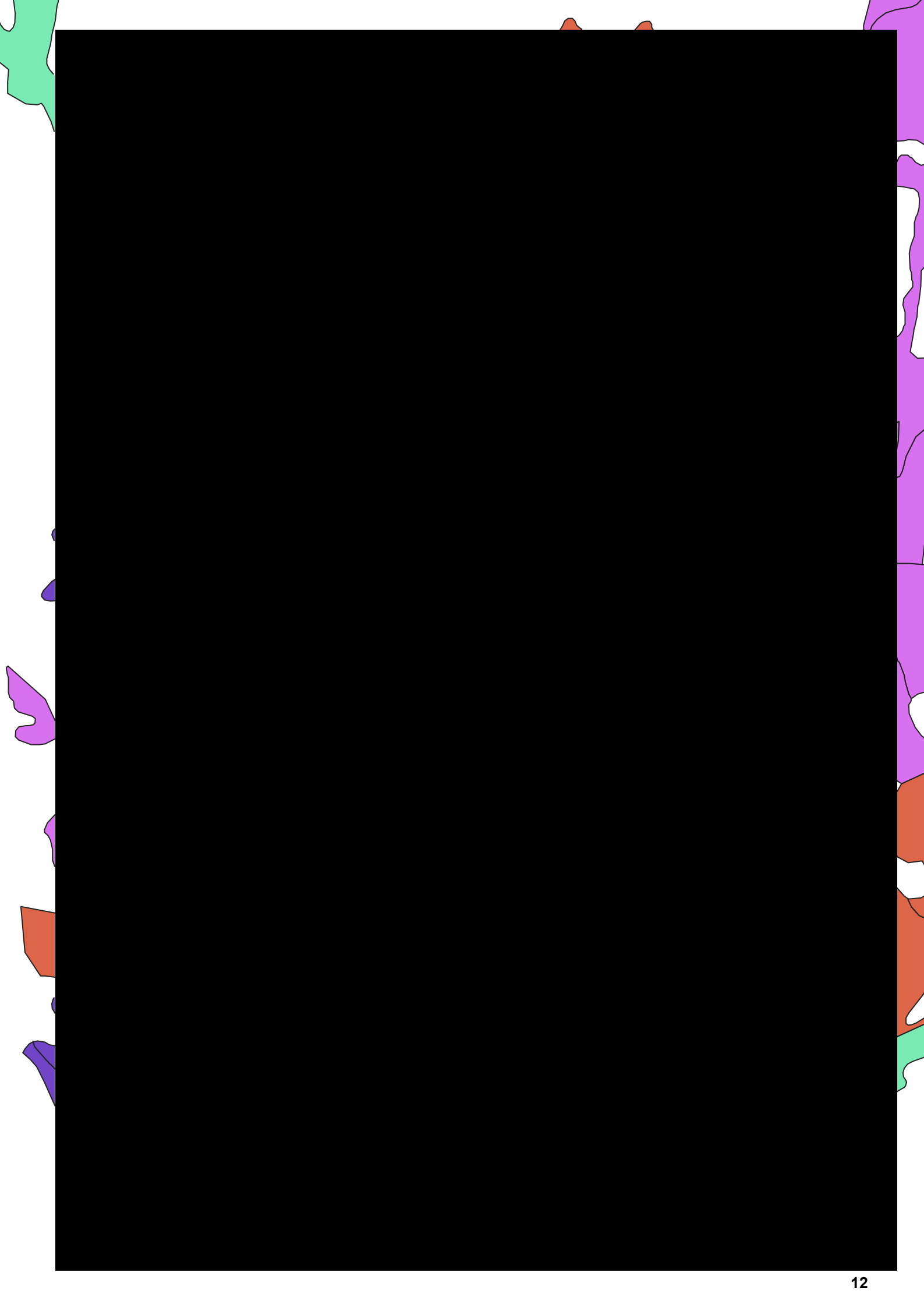
- 1 Company profile and brief CVs

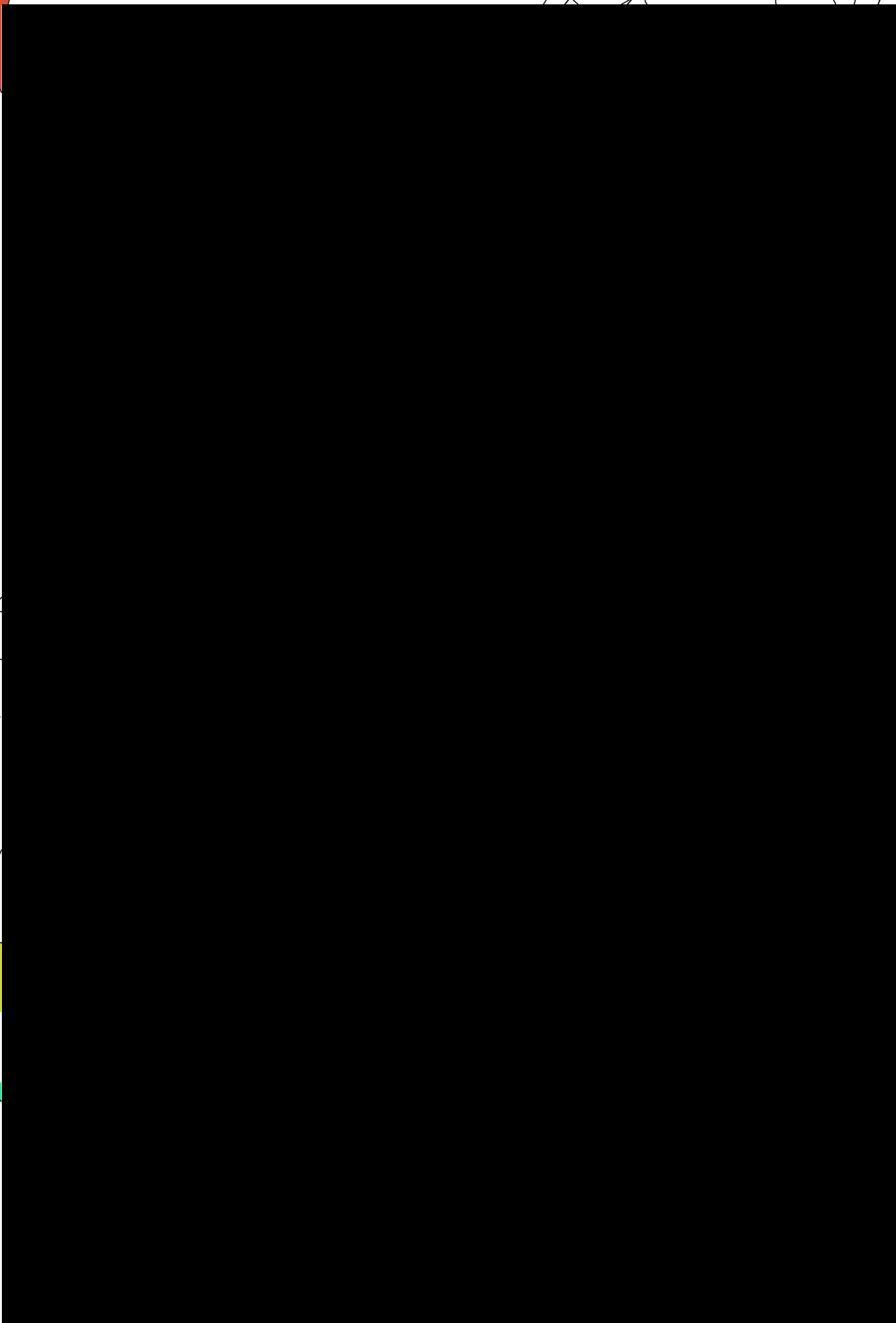
Figures

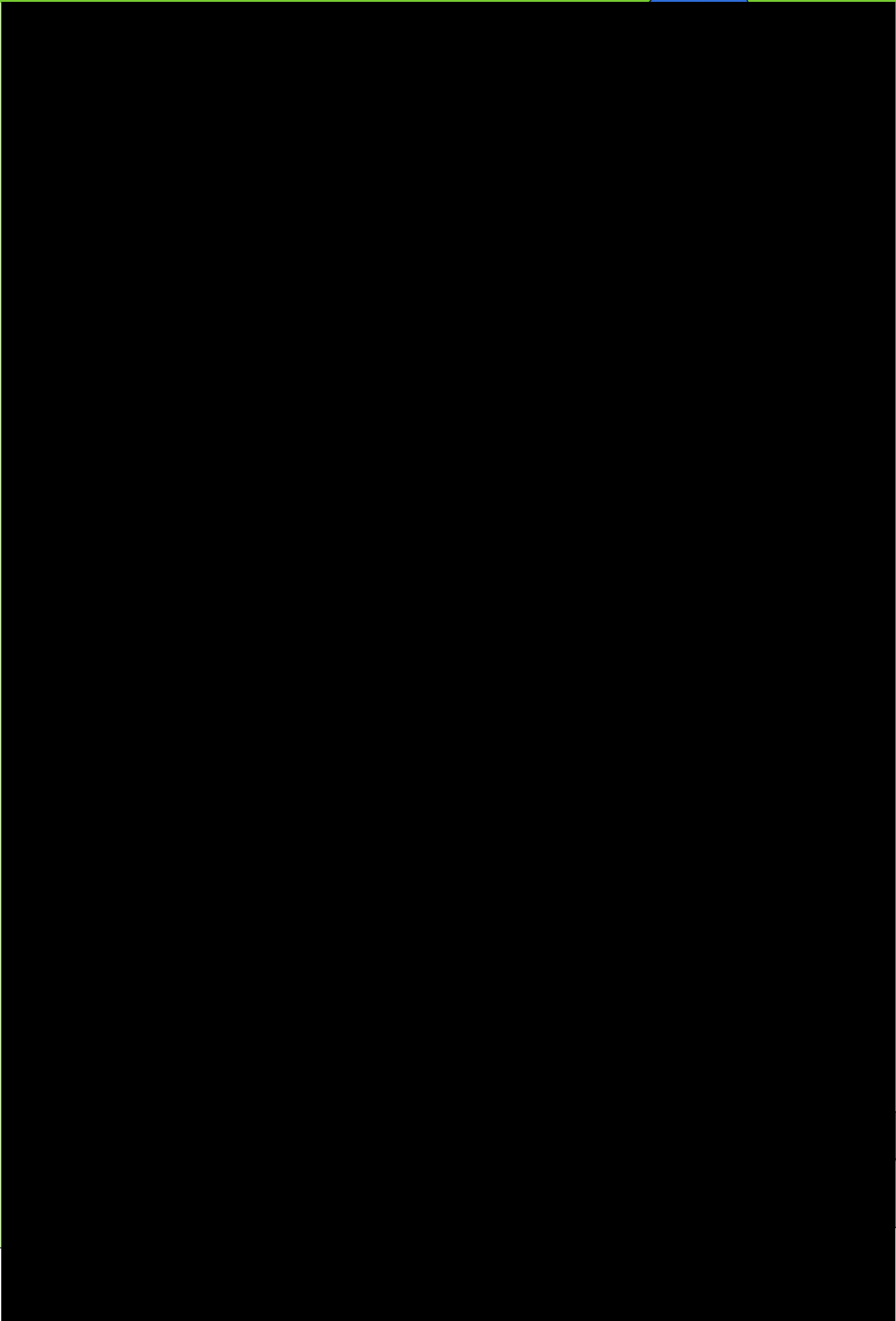


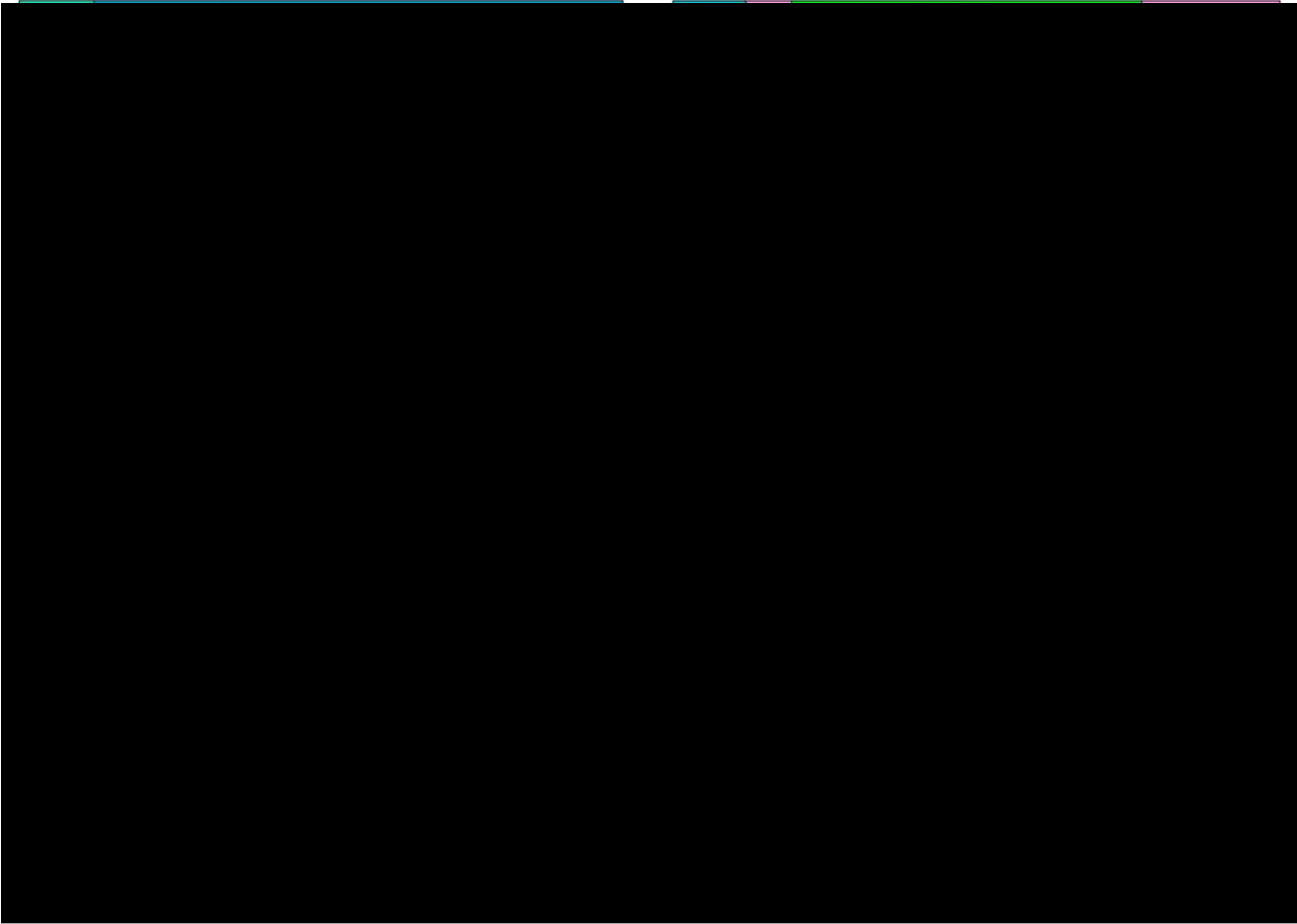


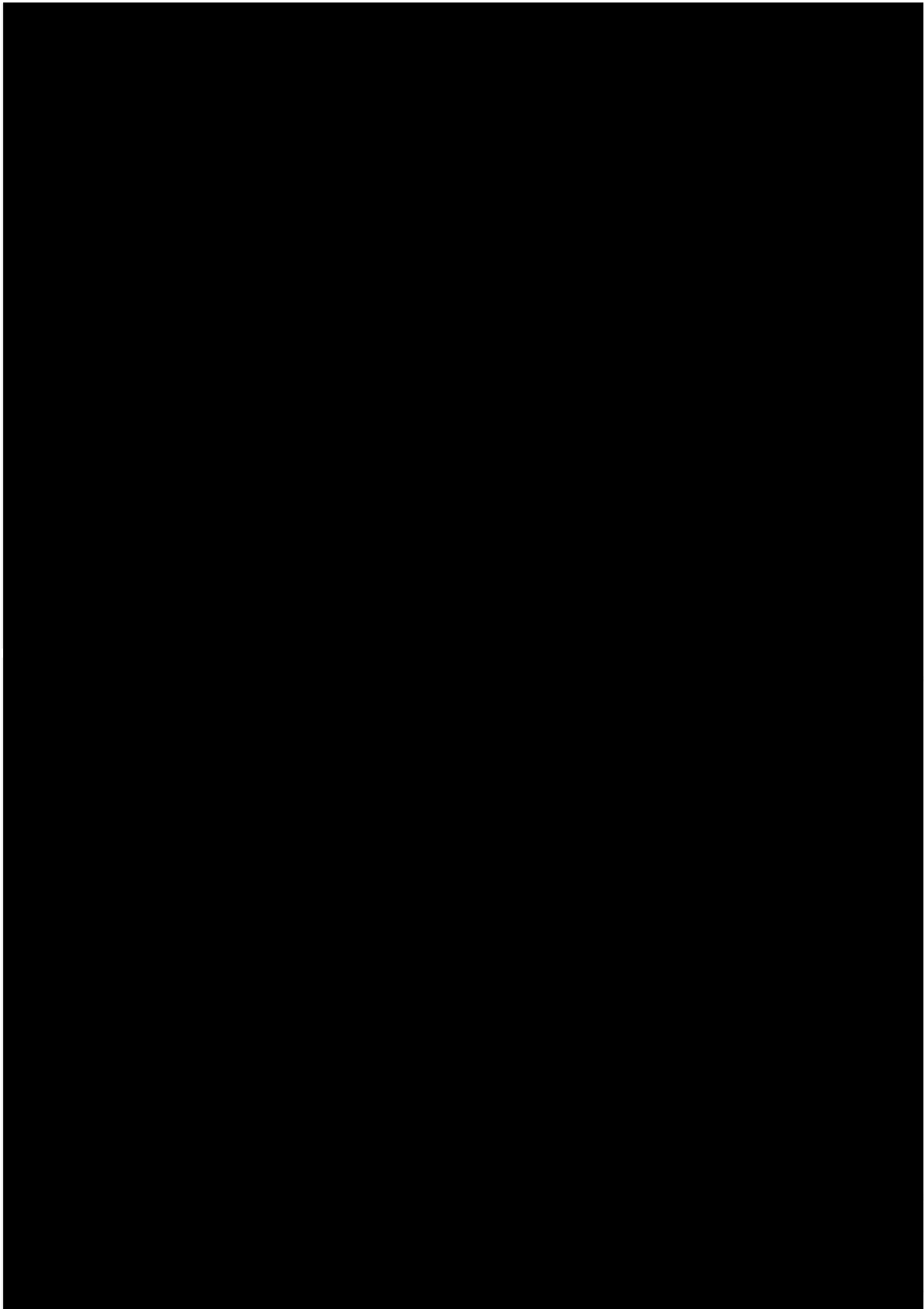


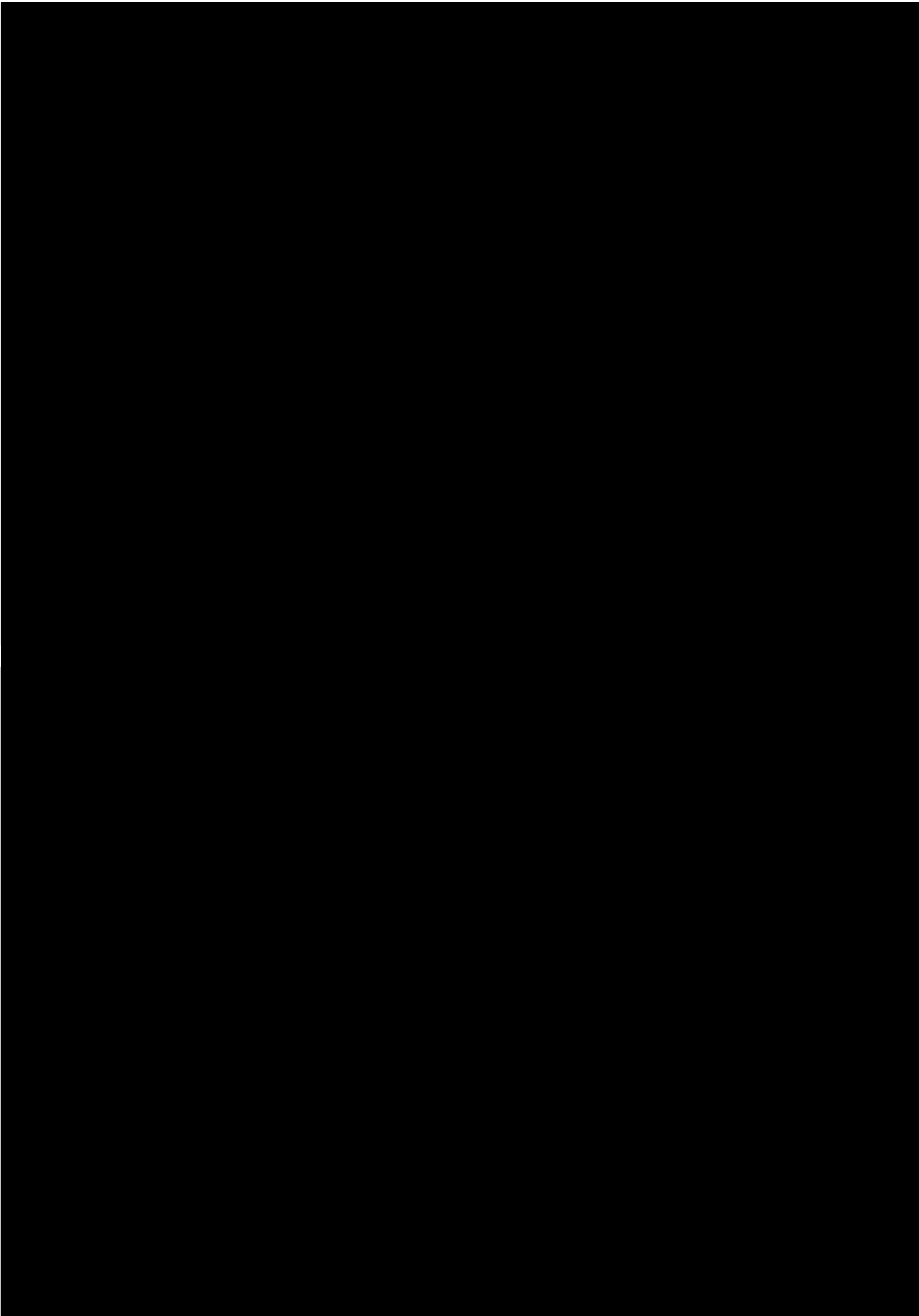












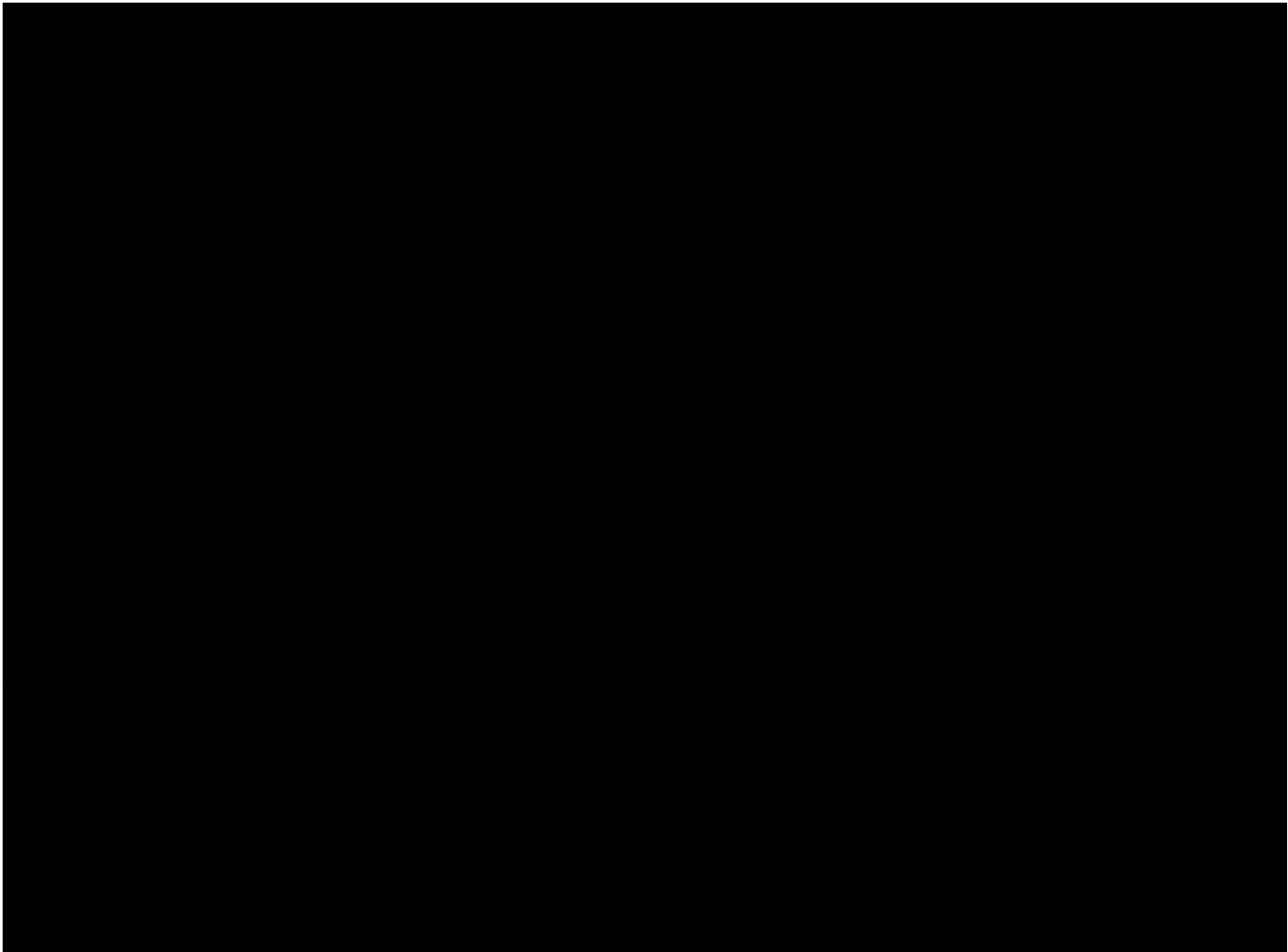


Table 1
Changes in canopy cover over time in Paddock F (see Figures 4, 5)

Estimated projected foliage canopy cover

Year	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	Paddock 15
1970	6	8	42	47	44	48	35
1978	6	6	17	11	16	9	14
1989	6	7	32	27	26	12	17
1991	9	8	33	30	28	13	19
1994	9	8	35	30	31	14	19
1998	8	6	34	13	30	14	14
2020	10	2	21	22	20	11	13

Note: Approximately half of the percent of area is assumed to be canopy cover.

Appendix 1.
Company profile and brief CVs



ANNE CLEMENTS & ASSOCIATES PTY. LIMITED
(ABN 41 077 242 365, ACN 077-160-939)



7 May 2020

Anne Clements & Associates is a group of botanists, ecologists and restoration ecologists who specialise in botanical conservation assessment, as well as developing and implementing optimal conservation strategies. The company has more than 25 years of experience in:

- flora surveys of a wide range of ecosystems;
- flora assessments;
- assessments of impacts;
- vegetation plans of management;
- the implementation of rehabilitation/conservation programs as part of sustainable development of sites; and
- environmental management of development sites.

The company works closely with community groups, fauna consultants, town planners, geologists, engineers, lawyers, land developers and mining companies in planning and implementing optimal conservation strategies as part of sustainable development of sites.

Four of the company's environmental managed sites have won excellence awards for their quality and innovations, including "Excellence of Excellence" in 2000, Gold and Silver in NSW Rivercare 2000, Silver and Excellence in NSW Mineral Resources Excellence Awards and Excellence in the Earthmovers Awards, 2006 Environment Award for Australian Property Industry and 2007 International Green Apple Award.

Brief CVs

The group provides a broad variety of skills and a high level of experience:

Dr AnneMarie Clements

Senior restoration ecologist with M.Sc. (Macquarie Univ.) Thesis - *The vegetation of bushland in the northern Sydney area* and a Ph.D. (Univ. of Sydney) Thesis - *The vegetation of the sand masses of the mid-north coast of New South Wales*. She has more than 25 years experience.

Her major research interests include the re-establishment of native ecosystems, impacts of urban development on vegetation and soil, pattern analysis, effects of inundation and salinity on the plant communities, metal concentrations on plant growth and bioaccumulation. She has utilised her research in designing and implementing rehabilitation / conservation programs as part of sustainable developments.

Anne is certified as a BAM Assessor (Accreditation Number: BAAS17088) under the *Biodiversity Conservation Act 2016*, a BioBank Assessor, and an Ecology Specialist Certified Environmental Practitioner under the Environmental Institute of Australia and New Zealand CEnvP Program (CEnvP Registration Number E200001).

Dr Anne Baumann

Anne is a flora ecologist with 7 years experience in consultancy. Anne has a B.Sc. in Agriculture from the University of Sydney and a Ph.D. on the recruitment of the Broad-leaved Paperbark Tree. She also has a Diploma in Arboriculture, Certificate III in Conservation and Land Management and she has completed an internship with the NSW Herbarium.

She has over 15 years broad industry experience in a range of technical flora related roles including with the NSW Office of Environment and Heritage, Biosecurity as well as having work as a bush regenerator. Her skills include writing vegetation management plans, arborist reports and tree protection plans, and biodiversity assessment reports. She is experienced in flora surveys, GIS and has also implemented vegetation management plans including sourcing stock, supervision of soil preparation, planting and monitoring.

Tony Rodd

Taxonomic botanist with B.Sc. (University of Sydney) with extensive experience in plant identification. Tony was the Horticultural Botanist at the Royal Botanic Gardens, Sydney for 13 years (1970-82). After leaving the Gardens, he continued as an occasional consultant, including preparation of interpretative material and collection of plants from the wild for the living collections at the Mount Annan and Mount Tomah Botanic Gardens.

He has also worked extensively with book publishers, most recently in the role of Chief Consultant for *Botanica* (Random House 1997) and *Flora* (Timber Press / ABC Gardening Australia 2003), and co-author of *Trees: a visual guide* (Weldon Owen 2008). He has a long-standing interest in the taxonomy of Australian palms and has had a major revision of the palm genus *Livistona* published in the journal *Telopea*. For more than 25 years, he has worked with Anne Clements & Associates on many flora surveys and rehabilitation projects.

Dr Pamela Hazelton

Dr Pam Hazelton is a Certified Professional Soil Scientist (CPSS). She graduated from the University of Sydney with a Bachelor of Science degree; gained a Diploma of Education from the University of New England and a PhD from the University of NSW. She is an experienced pedologist of more than 30 years, and has produced over half of the Western Division (NSW) land system maps and also soil landscape maps in the south-eastern areas of New South Wales, Australia. She has published scientific papers on a variety of soil and education topics and is the editor of a widely used research text for the interpretation of soil test data.

Throughout her career she has lectured at a variety of universities including Hong Kong and France, worked in a government department and also worked as a consultant specialising in the association of soil types and their relationship with endangered ecological communities. Dr Hazelton's major research interests lie in the application of soil science to environmental engineering specifically in the areas of salinity, sodicity and acid sulfate soil in coastal and urban land use. At present she is the Program Head and coordinator of the Master of Environmental Engineering Management in the School of Civil and Environment, Faculty of Engineering, University of Technology, Sydney.

Dr Margaret Donald

Margaret holds a Ph.D from the Queensland University of Technology; Thesis: *Using Bayesian methods for the estimation of uncertainty in complex statistical models*. She has been a co-author of 14 published journal articles and currently has additional articles in press.

Margaret's previous positions include a Senior research statistician, responsible for the development and design of databases and acquisition of machine data for Polartechnics Pty.Ltd, biometrician for Sydney Water, post-doctoral research fellow at UNSW. Margaret is engaged by Anne Clements & Associates to undertake statistical analysis of field collected data and for advice regarding field experiments. Margaret has been recognised by her peers (the Statistical Society of Australia) as a highly competent statistician with the award of an Astat.

Joelan Sawyer

Joelan hold a Bachelor of Science majoring in Biological Conservation and General Biology (Western Sydney University 2018). Joelan has conducted research on the effects of forest fragmentation by monitoring changes in stomatal densities in the vegetation at the edges and cores of vegetation communities. He has experience in vegetation surveys, plant identification, GIS mapping and data analysis. Joelan has a passion for biology particularly botanic and fresh water aquatic ecology. Joelan has experience in cultivating and propagating both native and exotic plant species as well as extensive experience in breeding freshwater fish species. He has used his skills as ecologist in survey and environment restoration for the past 2 years.

Peter Radcliffe

Peter is a final year undergraduate in Environmental Management at Macquarie University. He has field experience with urban streams including Port Hacking River, vegetation surveys and micro-bat species relationships with insect biomass in the Shoalhaven region. Peter has a keen interest in geology and soil and has worked on various projects including planting and weeding, calculating projected foliage cover, and GIS mapping.