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90461

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

National Certificate of Educational Achievement
TAUMATA MĀTAURANGA Ā-MOTU KUA TAEA

Level 2 Biology, 2006

90461 Describe concepts and processes relating to ecology

Credits: Three
2.00 pm Thursday 30 November 2006

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should answer ALL the questions in this booklet.

If you need more space for any answer, use the page(s) provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–9 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

For Assessor's use only	**Achievement Criteria**		
Achievement	**Achievement with Merit**	**Achievement with Excellence**
Describe biological concepts and processes relating to ecology.	Explain biological concepts and processes relating to ecology.	Discuss biological concepts and processes relating to ecology.
Overall Level of Performance		

You are advised to spend 35 minutes answering the questions in this booklet.

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QUESTION ONE: LIVING TOGETHER

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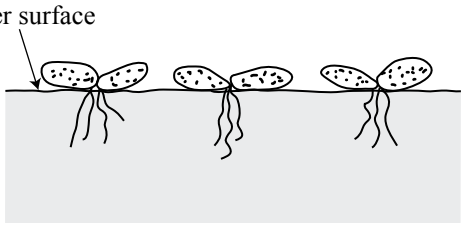
http://waynesword.palomar.edu/imglemt.htm

Duckweeds (*Lemna* sp.) are small free-floating plants. They often form dense mats on or just below the surface of still or slow-flowing water. Air sacs in the leaves enable the leaves to float.



Side view of *Lemna* sp.

In an experiment, two species of *Lemna* were grown separately and then together. The graphs below show the results obtained.

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Relph, Pedder, Delacey, *Life Science*, 1986, Heinemann, Auckland, p 20.

(a) Describe the growth of species A when cultured **separately**.

_____

_____

_____

(b) Describe the relationship between the two species when grown together.

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(c) Explain how *Lemna* species are adapted to survive in their habitat.

QUESTION TWO: FOREST COMMUNITIES

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Below is a diagram showing the distribution of plant species relative to drainage.

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Modified from John Wardle, *The New Zealand Beeches*, New Zealand Forest Service, Wellington, 1984, p 139.

(a) Give the term to describe the distribution pattern in this community.

(b) Explain why the distribution of the plant species in this community shows this pattern.

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The diagram shows a mature forest.
Stratification can be observed in this forest.

Richard Allan and Tracey Greenwood, Y*ear 13 Biology 1999 Student Resource and Activity Manual*, Biozone, Hamilton, 1999, p 44.

(c) Describe stratification.

(d) Discuss how the canopy trees affect the abiotic factors **and** the other species present in the forest.

QUESTION THREE: BIRDS IN A PINE FOREST

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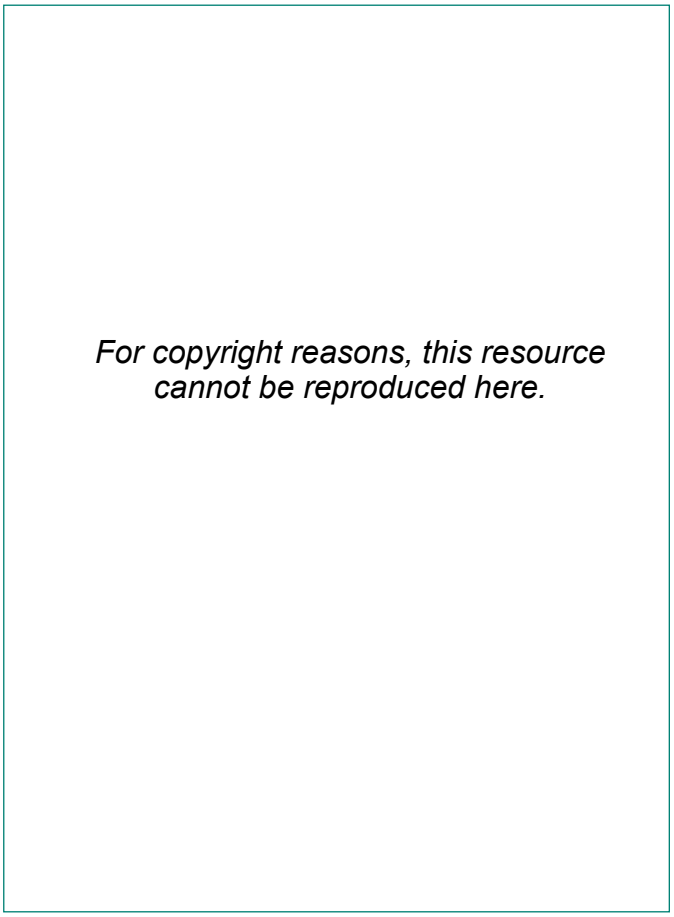
Pine forests are home to a number of insect eating birds. The distribution of the seven species illustrated show that they inhabit the same region of forest, but different parts of a tree. Insects form part or all of their diet.



Adapted from Knox, G A (ed), *Biological Science*, 1969, Government Printer, Wellington, p 36.

In some forests, the populations of some native bird species decrease as numbers of introduced species increase.

(a) Define a population.

_____

_____

(b) Draw a pyramid of numbers to show the age structure of a new bird species establishing in an area.

(c) Describe THREE aspects of the ecological niche of the fantail.

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(d) Discuss how and why the seven species of bird are able to co-exist in the same region of forest.

Note that Question Four follows on the next page.

QUESTION FOUR: MATERIALS IN A COMMUNITY

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Energy and **nutrients** are important materials in a community.

Compare and **contrast** the movement of energy and nutrients in communities. You may use diagrams in your answer.

Extra paper for continuation of answers if required.
Clearly number the question.

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Question number	