

2019 VCE Outdoor and Environmental Studies examination report

General comments

Most students attempted every question in the 2019 Outdoor and Environmental Studies examination.

The following observations are offered as advice to teachers and students.

- When discussing major topics, teachers should use a variety of environments or examples where possible. It was evident in answers to Question 5, for example, that a number of students had used the Wonthaggi Desalination Plant for studying both environmental conflicts and water management. Students' responses showed a lack of clear distinction between the two issues and most answers focused on environmental conflict, rather than water management.
- Students should integrate examples from environments they have visited or studied. They should avoid providing generic responses, with only a concluding reference to their specific environment.
- When discussing relationships students attempted to break these down into separate components. This often led to generic responses that did not link back into the question. While interactions and impacts can demonstrate aspects of a relationship, without linking to the perception of the individual or society, simply discussing an interaction or an impact in isolation does not discuss the relationship.
- Many students had difficulty in clearly distinguishing between impacts on the environment and impacts on the human relationship. This is a crucial distinction in evaluating impacts.
- It is essential that students understand and be able to articulate why an impact has occurred and what this means for the human relationship.
- Students need to ensure they understand key terminology such as biodiversity, urban planning and climatic variation and know how to describe these, using examples.
- Teachers should ensure that all key knowledge and skills are covered adequately. Students seemed to find some areas harder than others to address with specific examples. In particular, they were able to demonstrate a base level of knowledge of Acts and conventions, but often struggled to relate this appropriately to a specific environment. Ideally, students should visit or study a specific area where the Act or convention under study is in use. Similarly, students could generally discuss recreation and conservation well but had difficulty with providing a clear discussion of primary industry and tourism, frequently using the two interchangeably.
- Students need to ensure they are responding fully to the given question and not just providing generalised information about a topic.
- In order to receive full marks, question instructions such as 'including the following' or 'at least one of the following' must be followed.
- Students must respond appropriately to the command terms in each question, and teachers should be ensuring that students have practice in responding to these different terms as they appear in the key skills sections of the study design.

- Where two command terms are used in a question, students must ensure they address both.
- When asked to make a comparison, students were required to demonstrate knowledge of both sides of the topic and then draw out similarities or differences between them. Students should avoid merely providing two separate paragraphs of information about each side of the question and should provide linkage by using terms such as 'however', 'whereas' or 'in comparison to'. Simply placing these terms between two separate paragraphs of information was not enough to access full marks. Ideally students should be responding in a holistic manner with specific references to similarities and differences.
- Students should avoid highlighting in their responses as this can make it difficult to read.
- Students should consider planning responses that are extended or where questions contain multiple command terms, to ensure they address all aspects of the question. This can be done in the extra space at the end of the exam booklet.
- Students should ensure they only write on the answer lines provided. If they need additional space for their answer they should complete it in the extra space provided, with the question number and part clearly labelled. The extra space should be used, not the space provided for the extended response to the final question.

Specific information

Note: Student responses reproduced in this report have not been corrected for grammar, spelling or factual information.

This report provides sample answers, or an indication of what answers may have included. Unless otherwise stated, these are not intended to be exemplary or complete responses.

The statistics in this report may be subject to rounding resulting in a total more or less than 100 per cent.

Question 1

Marks	0	1	2	3	4	5	6	Average
%	11	2	8	11	23	16	30	4

Students were required to outline three measures undertaken to minimise their impact on the environment while participating in an outdoor activity.

Students generally responded well with examples of individual practices they and their class had undertaken to minimise their impact on the environment they were visiting. Responses that included management strategies the students could not interact with, such as lining the Yarra River with bluestone and placing litter traps in the river, did not attract marks, as these are not measures that were undertaken while they were participating. Responses such as the use of drop toilets, carrying out rubbish, and sticking to tracks and boardwalks, were acceptable.

The following is an example of a high-scoring response.

Outdoor Activity: Hiking

Measure 1: A measure we used was taking out everything we took in, such as food waste, plastic, and other waste we created or found, so no waste was left in the environment.

Measure 2: Using drop toilets while hiking allowed us to keep animals from consuming human waste and becoming sick as well as possibly entering waterways.

Measure 3: We did not light any campfires at night to prevent the fire from scarring the land and the possibility of it spreading and starting a bushfire.

Question 2

Marks	0	1	2	3	4	5	6	7	8	9	Average
%	9	1	2	3	4	6	11	14	18	32	6.6

Students were required to identify three characteristics of the Australian environment and explain how they impacted the environment prior to human settlement.

Most students were able to correctly identify three characteristics and high-scoring responses used specific examples in their explanation. Students who used current-day examples in their explanation only received marks for correct identification. If their explanation was inaccurate, marks were awarded for identification only. This was also the case for students who had a good explanation but had not clearly identified the characteristic.

The following is an example of a high-scoring response.

Characteristic 1: Biological isolation was caused when Australia split from Gondwana and the flora and fauna were completely isolated. This caused them to evolve and adapt completely separate from organisms in other parts of the world, leading to a large amount of unique endemic species such as monotremes (platypus) and Eucalyptus trees (River Red gum)

Characteristic 2: Geological stability is due to Australia being in the centre of the Indo-Australian tectonic plate. This has led to Australia being free of geological natural disasters like volcanoes, causing the soil to be old and not recycled. The old soil is poor in nutrients and therefore doesn't offer much energy to Australian organisms. Kangaroos adapted to hop instead of run to overcome this obstacle as hopping is more energy efficient.

Characteristic 3: Climatic variations in Australia are due to the erratic weather of the country as well as El Nino (Drought) and La Nina (Flood and rain). The erratic weather of Australia has caused it organisms to adapt to changing climates. The snow gum has long, skinny waxy leaves that hang down and spin to decrease direct sunlight from the harsh sun during the summer, but it is also short and robust to withstand the strong, cold winds of winter.

Question 3

Marks	0	1	2	3	4	5	6	Average
%	1	2	11	21	15	24	27	4.3

Students were required to compare the relationship a specific Indigenous community had with their environment to that of the first non-Indigenous settlers.

Students were generally able to provide a response about an Indigenous community's relationship with the environment and how the first non-Indigenous settlers interacted with the environment. Some students had difficulty with the comparison aspect of the question, with some simply providing two separate paragraphs of information with no link or only using a linking term such as 'whereas' or 'however'. Students who scored highly provided a number of specific comparisons throughout their response.

The following is an example of a high-scoring response.

Indigenous community: Yalukit Willam

Outdoor Environment: Hobsons Bay

The Yallukit Wilam perceived Hobsons Bay as 'their mother' that is they protected it, it will in turn protected them. This is in contrast to the first-non indigenous settlers who perceived the environment as something to be fearful of because it was unfamiliar.

The Yallukit Willam often firestick farmed in Hobsons Bay in order to allow plants to rejuvenate/regerminate and to reduce bush density. European settlers however, introduced species from home in order to allow for active hunting and companionship. This involved the introduction of rabbits, foxes, cattle and other hard hooved animals. (bringing a piece of home)

The impact that the Yalukit Willam has on Hobsons had on Hobsons Bay was positive. This is because firestick farming reduced the prevalence of serious bushfires that would damage fragile ecosystems, such as Truganina Swamp. However European settlers caused a negative impact on Hobsons Bay as hard hooved animals caused erosion of nutrient dense topsoil reducing native vegetation, such as kangaroo grass.

Question 4a.

Marks	0	1	2	3	4	Average
%	17	11	40	11	21	2.1

Students were required to describe one example of commercialisation and one example of a societal response to risk-taking in reference to a specific environment as indicated by the student.

Students were generally able to provide an appropriate example of commercialisation that was linked to the environment they had listed. However, a number of students found it harder to clearly demonstrate their knowledge of a societal response to risk-taking. In many cases students referenced an individual response to a specific incident, explaining that a person would not want to visit an environment. When discussing a societal response to risk-taking, factors such as increased regulation of participation (such as a requirement to wear helmets, instructor accreditation, access to particular areas), installation of fencing and signs to protect and warn people from dangers and activity ratios should be discussed.

Students must be able to look at an environment they visit and identify what safety precautions have been put into place and why.

The following is an example of a high-scoring response.

Outdoor Environment: Victorian Surf Coast

Southern exposure are a tourism company that provide surfing experiences to the public in return for money. Due to their packaging of outdoor experiences (lessons, accommodation) people are able to experience the Victorian Surf Coast first hand. A societal response to risk-taking can be to increase the staff to participant/client ratio to the outdoors more safe for their clients.

Question 4b.

Marks	0	1	2	3	4	5	6	Average
%	18	13	20	19	15	8	7	2.6

Students were asked to evaluate the effects of the commercialisation and societal response to risk-taking on society's relationship with the specific outdoor environment nominated in part a.

Students who did not score well in part a. were still able to achieve full marks in part b. if their response was sufficient. Most students responded strongly on the effects that commercialisation has on society's relationship with the environment, but when discussing societal responses to risk-taking, many focused more on the environmental impact than on the effects on society's relationship.

Responses often inadvertently turned to discussing the impact on the environment, without linking the evaluation back to how this affects the human relationship. It is crucial that students remember

this key step, otherwise their responses become about the impact on the environment, not the relationship. Responses can certainly refer to environmental impacts caused when discussing a relationship, but they must state how the impact subsequently affects the human relationship. For example, if discussing society's relationship with a coastal area used for surfing, factors such as using the area as a place for adventure and recreation and the feeling of having an escape may be discussed, along with the fact that in accessing the beach, sand dunes were eroded, which led to some species becoming threatened. The step that most students missed was to evaluate how this environmental degradation leads people to either develop a sense of responsibility for the environment and act to preserve and protect it, or to disregard the environment completely, because their only interest is in surfing.

The environmental impact cannot be the sole focus of the discussion if the question calls for the human relationship to be considered.

The following is an example of a high-scoring response.

Commercialisation can cause people to perceive the environment as a 'commodity' that can be purchased. This would decrease the levels of respect someone has for the environment as well as increase participation rates in recreational activity such as surfing. As a result, the Victorian Surf Coast may suffer from impacts related to overuse, such as erosion and destruction of native vegetation due to an increase number of participants. Overall, commercialisation has a negative effect on relationships, as it causes people to perceive the land as a 'commodity'. When people see that tourism companies like Southern Exposure have increased their staff to participant ratio they would perceive the environment as a safe place to participate in recreational activities. This can lead to a great appreciation and respect for the Vic Surf Coast and cause people to partake in conservational activities like recycling. This would have a positive impact on the land as conservational efforts would increase due to a greater appreciation of the environment. Overall, societal responses to risk taking would have a positive effect on relationships, as it causes people to have a great appreciation of the Vic Surf Coast.

Question 5a.

Marks	0	1	2	3	4	5	6	Average
%	27	8	23	14	19	4	5	2.3

Students were given a stimulus statement about the Murray-Darling river system management issue and asked to explain two sides of the social and political debate about water management in Australia.

Students generally seemed unsure of the topic of water management and how to discuss two sides of the debate. Many students used the Wonthaggi Desalination Plant as their water management issue. As mentioned in the general comments, while this can be used as a water management issue, students who chose this tended to focus on the environmental conflict issue, rather than the issue of water management. These responses did not score well, depending on how they addressed the topic. To prevent confusion for students, it is strongly recommended that a separate water management issue be studied; given the number of current water management issues, there is a large range of resource material available for a wide range of issues.

The following is an example of a high-scoring response.

The Murray-Darling river system is currently in distress due to drought and overuse. One side of this debate is the farmers who need water for their livelihood. Without accessing water from the river, farmers will not be able to water their crops and provide water to livestock. However, there is controversy about one station in particular who cotton farm and have removed a significant amount of water from the river. Part of the debate has been around that cotton is an inappropriate crop for the Australian environment due to the amount of water that cotton requires to grow.

On the other side of the debate are people who are concerned for the health of the river-system want to see more water kept in the system for environmental flows to prevent things such as mass fish kills from happening. They believe that more water should remain in the system in order to preserve its health as this will benefit both the river system and those surrounding it in the long run.

Question 5b.

Marks	0	1	2	3	4	5	6	Average
%	33	10	20	15	14	4	4	2

Students were required to analyse the effect of the debate explained in part a. on society's relationship with waterways in Australia.

Again, there was an issue with responses focusing purely on the environmental impacts or the environmental issues associated with the desalination plant, which did not adequately address the question.

The following is an example of a high-scoring response.

This debate brought a lot of attention to the state of the Murray-Darling river system. Many people were horrified with the state of the river and this led to people saying that something had to be done to protect the waterway better and various groups are looking to see what actions they could take. This has led to pressure being put on some of the cotton farmers that are able to access a large amount of water to consider how they are using water and the amount they are accessing given the current situation and to try and get them to shift their view to see the river as more than just a resource. If these larger stations have pressure placed on them from society as well as from the political side this will lead society to see that the waterway is essential for our survival, worth fighting for and develop a sense on connection or belonging to the area. However, if pressure isn't put on the cotton farmers and they are able to continue to access water even with the system in distress then people will feel they are fighting a losing battle and give up trying to protect the system which will lead them to also view the system simple as a resource that is only worth what it can give us.

Question 6

Marks	0	1	2	3	4	5	Average
%	23	8	21	24	16	8	2.3

Students were required to describe one example of increased environmental awareness and analyse its impact on policy-making in Australian politics before 1990.

Students were generally able to respond to the first part of the question well and used appropriate examples of increased environmental awareness. These included the Lake Pedder, Franklin River and Little Desert campaigns. However, some students did not address the second part of the question and, while their description of the increased awareness and knowledge of the specific campaign was of a high standard, they failed to make the link to the impact on policy-making pre-1990. Other students made links to the rise of green politics but did not sufficiently analyse or connect this back to the first part of the question. Some students' responses referred to current-day policies and parties, which did not meet the requirements of the question.

The following is an example of a high-scoring response.

In 1972 the South West Action Committee was formed (SWAC) and together with the United Tasmania Group (UTG), the world's first Greens political party, they fought for the protection of Lake Pedder, which was proposed to be dammed by the Tasmanian Government and Hydroelectric Commission. Despite their actions failing, and the lake being dammed, their campaigning and protesting brought conservation to the mind of the Tasmanians and between

1970s and 1980s these was an environmental shift, and the government put the environment as 2nd on their priority list. Because of this, Bob Hawke was voted in with Labour as the prime minister in 1983 as he was the only member of parliament to say he'd save the Franklin River. That same year Hawke put in place the World Heritage Properties and Conservation Act, a step in the right direction for the environment & the Franklin River was saved. The increased environmental awareness SWAC bought conservation to the minds of Tasmanians and positive policies began to be put in place soon after 1973.

Question 7a.

Marks	0	1	2	3	4	Average
%	31	5	20	9	35	2.1

Students were required to outline two current policies from major Australian political parties.

Given that this year has seen significant change in policies across all political parties due to the federal election, the choice was made to accept policies and targets from both pre- and post-election from all parties. Full marks were awarded where the policy and/or target was correctly identified (including target dates) and linked to the correct party. Most students were able to state a policy or target with enough clarity and link this to the correct party to obtain some or all marks.

The following is an example of a high-scoring response.

1. *Party: Greens Party*

Policy: To move to 100% renewable energy use by the year 2030

2. *Party: Liberal Party*

Policy: To move to 23% renewable energy use by 2020

Question 7b.

Marks	0	1	2	3	4	5	6	7	8	Average
%	36	3	9	9	12	8	12	5	6	3

Students were asked to analyse the likely impact of the policy outlined in part a. on a theme from the current national State of the Environment report.

Most students were able to accurately identify a State of the Environment report theme; however, some students found it difficult to provide an accurate link back to the policy or only provided a description rather than an analysis of how the policy would impact the theme. Students often responded that the party with the weaker policy would cause environmental damage and the party with the stronger policy would improve the environment. It is important that students realise that both weak and strong policies frequently represent improvement for the environment; the difference is that the weaker policies are likely to have a slower or less positive impact on the environment.

The following is an example of a high-scoring response.

Policy 1

Theme: Atmosphere

The use of renewable energy sources such as solar power and wind turbines instead of fossil fuels would help to decrease the effects of climate change. According to the State of the Environment report, climate change is a major contributor to the reducing health of

environments. Less fossil fuel emissions such as carbon dioxide would increase the health of the air/atmosphere in environments, positively impacting on flora and fauna health. It would also stop the creation of coal mines which significantly contribute to land clearing and habitat destruction.

Policy 2

Theme: Biodiversity

Although an attempt is made by the liberals to reduce fossil fuel use, it is not enough of a change to significantly improve the state of biodiversity in Australia. Currently, many species of flora and fauna are being impacted by fossil fuels and the creation of mines and oil drilling in the ocean. Due to the liberals continuing this and even supporting it, species will continue to be impacted. Ecosystem biodiversity will also be negatively impacted through land clearing and oil drilling in marine environments.

Question 8a.

Marks	0	1	2	3	Average
%	29	29	26	16	1.3

Students were required to select either the *Flora and Fauna Guarantee Act 1988* (FFG) or the Ramsar Convention (international treaty, 1971) and explain its origins.

Most students were able to demonstrate some knowledge, but responses tended to be generalised or missed key points, such as the FFG being Victorian legislation rather than national.

As some teachers may have noted, the FFG has been amended to the *Flora and Fauna Guarantee Amendment Act (2019)*. The study design has been updated to reflect this.

The following is an example of a high-scoring response.

The Flora and Fauna Guarantee Act originated following a drastic decline in Victoria's biodiversity in the 1980's. The state government recognised this decline and sought to legislate to prevent it from happening again. This act was born out of care for the environment and governmental desire to protect it, as well as Victoria's biodiversity.

Question 8b.

Marks	0	1	2	Average
%	39	38	24	0.9

Students were to describe one aim or objective of the Act or convention they chose in part a.

While verbatim responses were not expected, key terminology and themes were. Responses tended to be general or vague, particularly in relation to the FFG, for which students often provided generic statements about protecting flora and fauna. Students were expected to know this content in depth and be able to provide more specific responses.

The following is an example of a high-scoring response.

Identify possible threatening processes and practices relating to threatened Victorian flora and fauna. By identifying threatening processes, the government and environmental groups can implement a more permanent solution, allowing ongoing protection of threatened species rather than a temporary remedy for endangered species.

Question 8c.

Marks	0	1	2	3	Average
%	26	29	27	18	1.4

Students were required to explain the role the selected Act or convention plays in protecting outdoor environments.

Those who used specific examples were able to provide much more in-depth responses and therefore scored highly. Students were eligible to access all marks on this part of this question, regardless of their responses for the previous parts. Most attempted the question.

The following is an example of a high-scoring response.

The Flora and Fauna Guarantee Act (FFG) provides a legal obligation to Victoria to ensure the biodiversity of our environment is protected. The FFG determines endangered species, allowing interest groups to engage in practices that protect these species. For example, the Mountain Pygmy Possum is listed as a threatened under the FFG, with scientists taking this assertion and engineering new Boulder Fields in the Alpine National Park in order to protect Mountain Pygmy Possum populations and as such the biodiversity of the Alps.

Question 9

Marks	0	1	2	3	4	5	6	7	8	Average
%	6	4	9	12	15	11	17	11	14	4.7

Students were required to select two sustainable actions from the list provided and explain how each of their selections enables the sustainable use of an outdoor environment they visited or studied this year. Students were requested to use specific examples.

Many scored well on this question, demonstrating a sound understanding of their selected actions and providing specific examples. Green building and integrated farming were popular responses with Landcare and urban planning less popular and with lower-scoring responses. Students who were able to make a link to a specific environment tended to provide a higher-scoring response by recalling important information about their selected action and providing clear examples.

The following is an example of a high-scoring response.

Action 1: Green Building Design is the practice of creating structures with sustainable and resource efficient practices. For example the Kiewa Discovery Centre located at the Bogon Snow School helps sustain the Alpine National Park due to its sustainable features like composting toilets, insulated floors, water tanks and solar panels. The Kiewa Discovery Centre does not rely on fossil fuels for energy as they have solar panels which decreases CO₂ emissions in the atmosphere. Which helps sustain with the sustainable use of the ANP.

Action 2: Landcare is a program that facilitates a national network of farmers and community based groups that employ sustainable practices on land. They help sustain the Alpine National Park through three aims, improving farmland, bringing back trees and to restore Wildlife habitats. This ensures the sustainability of the ANP, as critical habitat for the endangered Mountain Pygmy Possum is restored and farmland around the ANP are healthy and sustainable.

Question 10

Marks	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Average
%	1	0	1	1	2	4	6	8	9	11	11	12	13	9	11	9.7

For this extended-response question, students were required to select an outdoor environment and write a report that could be shared with their local community, including:

- a description of the outdoor environment, with reference to the level of biodiversity, the quality and adequacy of the soil and water and the number of pests and introduced species
- an analysis of the importance of this environment remaining healthy for the community
- identification of a significant threat to this outdoor environment and a prediction of the potential impact on the community if this environment's health was to deteriorate.

Most students attempted this question and it was evident that they took advantage of the question's scaffolding and planned out their answers. This helped ensure that even students who were not as confident with the key skill of analysis were still able to score well, simply by breaking down the question.

While no marks were deducted if the response was not set out as a report, doing so helped students achieve high scores by enabling them to focus on sharing the information appropriately and in a succinct manner.

The following is an example of a high-scoring response.

Dear members of the local Falls Creek Community, both residents and tourists. Falls Creek overall is a healthy outdoor environment which is positive new for us. Biodiversity is the variety of plant and animal species within a region and here at falls creek we have a high level of biodiversity. Native flora and fauna such as the mountain pygmy possum, native birds, small marsupials and alpine growth including trees and shrubs both in the snow and grasslands are abundant.

The soil is of a high quality and adequacy as we receive a lot of rain. Soils are nutrient rich and have sufficient nitrogen to enable plant growth. It is soft and brown and isn't affected by wind erosion or those pesky hard hooves compacting mountain cattle grazers as we banned it! The water is also of a high quality and adequacy. Flowing streams and rivers remain clear and see through and not turbid, no nasty odour or smell. You can even drink it – and it tastes quite nice and refreshing! No metallic tastes here. The pH is of an acceptable higher range meaning it is less acidic which is positive.

We work to eradicate pest and introduced species such as hawkweed, a toxic weed that spreads rapidly and can poison other native plants or animals. We display signs warning visitors of the environmental dangers of hawkweed and encourage them to call Parks Victoria if they see any to get it eradicated. Wild deer are a small issue as their antlers ringbark trees, but I did not see any of this past snow season when I was visiting. We have eradicated Alpine Cattle from grazing which was good as their cloven hooves compact the land, and make it harder to grow flora. Overall there is a high level of biodiversity, high soil and water quality and adequacy and introduced species are low and managed appropriately.

It is pertinent and highly important Falls Creek remains healthy for the community – that's you guys reading! Think about it, without a healthy environment you wouldn't be able to use and appreciate it. If Falls Creek remains healthy, recreation and adventure of skiing and snowboarding can continue so everyone can continue to enjoy themselves on weekends and holidays. Scientific research and future food and medicinal sources can also possibly be found and used. The flora of Falls Creek could one day cure a disease or be found to provide a health benefit. Education can occur in a healthy Falls Creek – tourists, school groups, even overseas visitors can learn about the importance of Falls Creek as well as all its aspects. Ranging from unique flora and cute fauna like the mountain pygmy possum to the land qualities such as geology and geography, soil health and how we get our water so pure! Of course, Falls Creek also provides economic value. I'm sure many of you readers work in tourism either as ski instructors, lift operators, cooks, cafes, gifting and retail, or hotel managers and cleaners, or maybe you drive a bus, local taxi service or even start up Uber! Without the millions of travel and tourists dollars many residents would struggle to find a career and support their family.

So many reasons why Falls Creek remaining healthy is positive and important for the community that live here permanently or just temporarily dropping by.

Although we must remember that climate change is a significant threat to Falls Creek in particular our lovely and abundant snow season. We all know that if the planet warms permanently and temperatures increase, this will melt our beautiful snow.

Due to climate change, the conditions could be too warm for native flora and fauna. They may go extinct, decreasing biodiversity. Soil may become dryer and less nutrient rich and water may not flow, instead sit and let sediment settle increasing turbidity. If climate change were to cause the health of Falls Creek to deteriorate, our wonderful community and fauna become extinct as they cannot cope with the warmer temperatures or the fauna's food source went extinct. This may prohibit the development of new medicine.

Education on the positive management and biodiversity of Falls Creek would not occur and instead we would be learning about where we went wrong and what not to do - still education I guess but not how we want it to happen.

Portray Falls Creek with a shorter ski season, economic value in tourism would not be able to be a maximised so less money could be generated into Falls Creek and our economy would weaken, people employed in tourism may have to find alternate careers which can be a challenge.

Therefore if Falls Creek health was to deteriorate due to climate change, it would significantly negatively impact our lovely community – and we wouldn't want that!

Sincerely,

Falls Creek Alpine Scientist 101