BIOL2050 LECTURE TEST 2. Marking key

Q	Concepts	Vocabulary/keywords to search/use	Application
1	Slides 55-65 Complementarity, redundancy, driver and passenger, and variation of D/P with complementarity. Final option best. Explain why. /4	Same as concepts. For design must mention terms concurrently, at the same time, full factorial, orthogonal or some variation of those terms	Two primary factors must be mentioned and tested: driver and passenger and complementarity or overlap. Slide 64. Must have an experiment that is able to differentiate between d/p and comp so full factorial. Then a bit of specific how the experiment is set up /4. Final 2: how the findings could be used by a manager IF supported then… IF not supported then --- such as manage for driver species but need X number of different species within the system too.
2	Restoration and conservation difference is about building up/adding versus protecting what we have by minimizing losses through saving habitat etc. MANY resources in addition to textbook that address this difference: http://tpyoung.ucdavis.edu/publications/2000ConseRestBiolCons.pdf Conservation biology integrates ecology, evolutionary biology, physiology, molecular biology, genetics, and behavioral ecology to conserve biological diversity at all levels. Restoration ecology applies ecological principles in an effort to return degraded ecosystems to conditions as similar as possible to their natural, predegraded state. Srivastava solutions: slides 16-20: test at larger scales, use idea of saturation, test the niches and whether there suitable species to replace lost, test non-random loss, slide 17 shows most of her ideas, need insurance by measuring stability and magnitude, and ensure that ecologists do not mix up detection and prediction. Any two of these for 2 points.	Retention, protection, identifying, versus adding, creating, controlling, and restoring to a 'state' or purpose, historical, biodiversity, loss, genetics, saturation, prediction, detection, non-random loss, extinction, niche, regional, species pool, insurance	slides 9,12,15 in Srivastava for the questions she proposed. 6 points: 2 for each question including how each one improves restoration). HOW TO MARK: as discussed in class and workshop: question must be 'different enough' from hers, reasonable, clearly about restoration and not conservation, and then the second sentence explains why it is a useful question that ecologists should provide the answer to restorationists. /6
3	IPCC challenge explained by Parmesan and Yohe: slide 3: global change is correlational, side 6 ecologists and economists value weak and persistent versus important now respectively differently (slide 7). Do not need to explain solutions here. Explain why IPCC is hard to work with using these ideas. /4 (look for at least two points well explained)	Weak persistent, important now, time frames or time scales, correlational, evidence, understanding, paradigms	Explain solution: test climate change in at least two ways now (slide 8). Use meta-analyses of evidence (slide 9) BUT also use probabilities (slide 13). 2 points for stating these solutions 1 each then 2 points to explain each well. TOTAL is 4. For the final 2 points state whether global change is real but referencing evidence. Must reference evidence for the 2 points, so 1 point for clearly stating opinion in a reasonable scientific way then the 1 for why based on ecology/science.
4	What is a meta 4/ explained using a solid resource (any of the three papers I have written on the topic, any good resource online.). Must state purpose of meta and how it is done in enough detail so that the reader is not left hanging. https://peerj.com/preprints/38.pdf Meta-analysis is an effective tool for synthesizing independent research efforts, comparing the relative success of treatments associated with groups of studies, testing whether mean treatment effects are significantly different than zero, and testing whether the effects are homogeneous or heterogeneous among and within groups or categories of studies. Unfortunately in ecology,	Effect size, variation, between versus within-study, many studies, literature, primary study, big picture, synthesis, aggregated data, counts	Must cite study for 0 points so that marker can look it up. Explain challenge of the study – ecological – research gap, conflict in theory, two competing hypotheses, whether an experimental design or method worked, whether an effect/process/impact was species specific. /2 points. Then final 4 points for how they solved the challenge in detail – not what they did in terms of stats but what they found (/2) and how their approach solved it (2) such as they tested lab versus field, high versus low stress etc.

	the semantics of synthesis, particularly use of the term meta-analysis, varies significantly (Vetter *et al.* 2013). Herein, we define an ecological meta-analysis as a review that includes statistical analysis of strength of evidence within and between the studies summarized (Koricheva and Gurevitch 2013; Vetter *et al.* 2013). Etc. must mention effect sizes and many studies or not a good definition. Must also mention how – ie aggregation and formal search.		
5	State each question then WHY you think it is important RIGHT NOW. Must have provided a compelling ECOLOGICAL argument, directly justifying why these two must be done immediately versus all the other ones. Depends on question but the reason should always invoke something we learned in the course – i.e. show what you know – such as global extinction rates, biodiversity loss, global chemical cycles (in ch 19 and 25 in last two weeks), IPCC or MEA reports, anything we covered in last two weeks. COULD have also used older material for course too such as trophic cascades, realized niches shrinking, loss of top predators, loss of mutualisms, Chamberlain meta of sensitivity to change for different ecological processes etc. /4	Sensitivity, global change, global cycles, extinction, rapid, global change, sea level, warming, temperatures, food weds, competition, invasive species	For ONE question, designed an experiment that addressed the question. HOW to mark: design tested the question in a clear, hypothesis/prediction way – even better if they stated a prediction OR a hypothesis, both or just one ok, used plug and play ideas, or gradients, or variation – ANY of the fundamental principles we discussed at least 2-3 times in course. Could change disturbance, diversity, nutrients, invasives, biodiversity, remove top predators, protect, add, or remove key ecological factors. 4 points for good design using ecological principles we discussed. FINAL 2 points – link to implications for practical USE by management or conservation – IF what you propose is supported how can society and people use to manage for better ecology – ie you answered your fav question ☺ what does it mean though?