Приложение к рабочей программе дисциплины

Профессиональный английский язык

Направление подготовки – 35.04.07 Водные биоресурсы и аквакультура
Направленность (профиль) – Организация и управление производством продукции в аквакультуре
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ФОНД ОЦЕНОЧНЫХ СРЕДСТВ

1 Назначение фонда оценочных средств (ФОС) по дисциплине

ФОС по учебной дисциплине – совокупность контрольных материалов, предназначенных для измерения уровня достижения обучающимся установленных результатов обучения, а также и уровня сформированности всех компетенций (или их частей), закрепленных за дисциплиной. ФОС используется при проведении текущего контроля успеваемости и промежуточной аттестации обучающихся.

Задачи ФОС:

– управление процессом приобретения обучающимися необходимых знаний, умений, навыков и формированием компетенций, определенных в ФГОС ВО, по соответствующему направлению подготовки;

– оценка достижений обучающихся в процессе изучения дисциплины «Профессиональный английский язык» с выделением положительных/отрицательных результатов и планирование предупреждающих/ корректирующих мероприятий;

– обеспечение соответствия результатов обучения задачам будущей профессиональной деятельности через совершенствование традиционных и внедрение в образовательный процесс университета инновационных методов обучения;

– самоподготовка и самоконтроль обучающихся в процессе обучения.

2 Структура ФОС и применяемые методы оценки полученных знаний

2.1 Общие сведения о ФОС

В соответствии с требованиями ФГОС ВО:

–Каждый кандидат на получение диплома электромеханика должен продемонстрировать способность принять на себя задачи, обязанности и ответственность.

–Минимальные знание, понимание и профессиональные навыки, требуемые для дипломирования.

–Каждый кандидат на получение диплома должен представить доказательство того, что он достиг требуемого стандарта компетентности.

ФОС позволяет оценить освоение всех указанных в рабочей программе дескрипторов компетенции, установленных ОПОП. В качестве методов оценивания применяются: наблюдение за работой (Performance tests), наблюдение за действиями в смоделированных условиях (Simulation tests), применение активных методов обучения, экспресс-тестирование, программированные тесты.

Структурными элементами ФОС по дисциплине являются: входной контроль (предназначается для определения уровня входных знаний), ФОС для проведения текущего контроля, состоящие из устных, письменных заданий, тестов, и шкалу

оценивания; ФОС для проведения промежуточной аттестации, состоящий из устных, письменных заданий, и других контрольно-измерительные материалов, описывающих показатели, критерии и шкалу оценивания; методические материалы, определяющие процедуры оценивания.

Применяемые методы оценки полученных знаний по разделам дисциплины

Тема	Текущая аттестация (количество заданий, работ)				Промежуточная аттестация
	Письменное задание	Устный опрос	Тестирование	Интерактивные методы контроля	
Agriculture	+	+		+	зачет
History	+	+		+	
Environmental problems	+	+		+	
The cultivation of moluscs	+	+		+	
Cultivation methods	+	+		+	
Fish farming	+	+		+	
Freshwater fish farming	+	+		+	
Грамматика	+	+	+	+	

2.2 Оценочные материалы для проведения текущего контроля

1. Устный опрос монологического и диалогического высказывания по темам.

1. Agriculture. 2History.3.Environmental problems. 4.The cultivation of moluscs. 5.Cultivation methods. 6.Fish farming. 7.Freshwater fish farming.

2. Письменное задание.

Тема	Содержание опроса	Предполагаемый ответ. Источник.
Types of cultivation	1. Ответить на вопросы. Стр. 6-7 2. Письменное задание Стр. 7-8	Яшникова Н.В. Иностранный язык : практикум к практ. занятиям и по самостоят. работе для студентов направления подгот. 35.04.07 «Водные биоресурсы и аквакультура» оч. формы обучения / сост.: Н.В. Яшникова ; Федер. гос. бюджет. образоват. учреждение высш. образования «Керч. гос. мор. технолог. ун-т», Каф. иностранных языков. — Керчь, 2019. — 68 с. Режим доступа: http://lib.kgmtu.ru/?cat=383
History	1. Ответить на вопросы Стр 12 2. Письменное задание Стр 11	Яшникова Н.В. Иностранный язык : практикум к практ. занятиям и по самостоят. работе для студентов направления подгот. 35.04.07 «Водные биоресурсы и аквакультура» оч. формы обучения / сост.: Н.В. Яшникова ; Федер. гос. бюджет. образоват. учреждение высш. образования «Керч. гос. мор. технолог. ун-т», Каф. иностранных языков. — Керчь, 2019. — 68 с. Режим доступа: http://lib.kgmtu.ru/?cat=383
Environmental problems	1. Ответить на вопросы Стр 14-15 2. Письменное задание Стр 15	Яшникова Н.В. Иностранный язык : практикум к практ. занятиям и по самостоят. работе для студентов направления подгот. 35.04.07 «Водные биоресурсы и аквакультура» оч. формы обучения / сост.: Н.В. Яшникова ; Федер. гос. бюджет. образоват. учреждение высш. образования «Керч. гос. мор. технолог. ун-т», Каф. иностранных языков. — Керчь, 2019. — 68 с. Режим доступа: http://lib.kgmtu.ru/?cat=383

The cultivation of moluscs	1. Ответить на вопросы Стр 22 2. Письменное задание Стр 22-23	Яшникова Н.В. Иностранный язык : практикум к практ. занятиям и по самостоят. работе для студентов направления подгот. 35.04.07 «Водные биоресурсы и аквакультура» оч. формы обучения / сост.: Н.В. Яшникова ; Федер. гос. бюджет. образоват. учреждение высш. образования «Керч. гос. мор. технолог. ун-т», Каф. иностранных языков. — Керчь, 2019. — 68 с. Режим доступа: http://lib.kgmtu.ru/?cat=383
Cultivation methods	1. Ответить на вопросы Стр 26, 27 2. Письменное задание Стр 27	Яшникова Н.В. Иностранный язык : практикум к практ. занятиям и по самостоят. работе для студентов направления подгот. 35.04.07 «Водные биоресурсы и аквакультура» оч. формы обучения / сост.: Н.В. Яшникова ; Федер. гос. бюджет. образоват. учреждение высш. образования «Керч. гос. мор. технолог. ун-т», Каф. иностранных языков. — Керчь, 2019. — 68 с. Режим доступа: http://lib.kgmtu.ru/?cat=383
Fish farming	1. Ответить на вопросы Стр 30 2. Письменное задание Стр 30-31	Яшникова Н.В. Иностранный язык : практикум к практ. занятиям и по самостоят. работе для студентов направления подгот. 35.04.07 «Водные биоресурсы и аквакультура» оч. формы обучения / сост.: Н.В. Яшникова ; Федер. гос. бюджет. образоват. учреждение высш. образования «Керч. гос. мор. технолог. ун-т», Каф. иностранных языков. — Керчь, 2019. — 68 с. Режим доступа: http://lib.kgmtu.ru/?cat=383
Freshwater fish farming	1. Ответить на вопросы Стр 34 2. Письменное задание Стр 35-36	Яшникова Н.В. Иностранный язык : практикум к практ. занятиям и по самостоят. работе для студентов направления подгот. 35.04.07 «Водные биоресурсы и аквакультура» оч. формы обучения / сост.: Н.В. Яшникова ; Федер. гос. бюджет. образоват. учреждение высш. образования «Керч. гос. мор. технолог. ун-т», Каф. иностранных языков. — Керчь, 2019. — 68 с. Режим доступа: http://lib.kgmtu.ru/?cat=383

3 Письменное тестирование по грамматическим темам.

3.1 Система времен.

1. Мы **сдаем** экзамены два раза в год.
a. take b. are taking c. have been taking

2. Я **учусь** в университете уже несколько месяцев.
a. am studying b. have been studying c. study

3. Я **окончил** школу два года назад.
a. left b. have left c. had left

4. Перед тем как поступить в университет, я **работал** на заводе.
a. worked b. had worked c. was worked

5. В прошлом году в это время я **сдавал** вступительные экзамены.
a. took b. was taking c. had taking

6. Я уже **написал** курсовую работу.
a. wrote b. was writing c. have writing

7. В конце каждого семестра они **будут сдавать** несколько экзаменов и зачетов.
a. will take b. will be taken c. will have taken

8. Он **напишет** доклад к 1 декабря.
a. will write b. will have written c. will be written

9. Сейчас я **пишу** тест по грамматике английского языка.
a. write b. am writing c. have been writing

10. Я **занимался** английским языком в течение пяти лет, перед тем как поступить в университет.
a. have studied b. had been studying c. had studied

11. I ... everyday.
a. have studied b. had studied c. am studying d. study e. have been studying
f. had been studying g. was studying

12. I ... right now.
a. have studied b. had studied c. am studying d. study e. have been studying
f. had been studying g. was studying

13. I ... for two hours.
a. have studied b. had studied c. am studying d. study e. have been studying
f. had been studying g. was studying

14. I ... Chapter One.
a. have studied b. had studied c. am studying d. study e. have been studying
f. had been studying g. was studying

15. I ... Chapter One, before I began to study Chapter Two.
a. have studied b. had studied c. am studying d. study e. have been studying
f. had been studying g. was studying

16. I ... last night, when Mother came.
a. have studied b. had studied c. am studying d. study e. have been studying
f. had been studying g. was studying

17. I ... for hours, when Mother came.
a. have studied b. had studied c. am studying d. study e. have been studying
f. had been studying g. was studying

Выберите глагол настоящего времени для перевода на английский язык:
18. Какие книги ты любишь читать?
a. Indefinite (Simple) b. Continuous c. Perfect

19. Что ты читаешь сейчас?
a. Indefinite (Simple) b. Continuous c. Perfect

20. Сколько времени ты читаешь эту книгу?
a. Indefinite (Simple) b. Continuous c. Perfect

21. Сколько лет ты изучаешь английский язык?

a. Indefinite (Simple) b. Continuous c. Perfect

22. Ты занимаешься английским языком регулярно?
a. Indefinite (Simple) b. Continuous c. Perfect

23. – Что ты делаешь сейчас? – Пишу тест.
a. Indefinite (Simple) b. Continuous c. Perfect

24. Мы сдаем экзамены каждый семестр.
a. Indefinite (Simple) b. Continuous c. Perfect

25. Тише. Студенты нашей группы сдают экзамены.
a. Indefinite (Simple) b. Continuous c. Perfect

26. Они сдают экзамены с 10 часов утра.
a. Indefinite (Simple) b. Continuous c. Perfect

27. Я **пишу** уже 20 минут.
a. am writing b. have been writing c. write

28. Я **изучаю** английский язык сейчас, (не мешайте мне!)
a. study b. have been studying c. am studying

29. Он **работает** 7 часов в день.
a. works b. is working c. has been working

30. Он **говорит** по телефону.
a. speaks b. has been speaking c. is speaking

31. Он **переводит** этот текст уже 2 часа.
a. translates b. has been translating c. is translating

32. **Дождь идет** осенью часто.
a. is raining b. rains c. has been raining

33. I am translating an article ... .
a. right now b. for two days c. every day

34. I translate articles ... .
a. since morning b. now c. every week

35. I have been translating an article ... .
a. every day b. now c. since two o'clock

36. Я **учусь** в университете с сентября.
a. study b. am studying c. have been studying

37. На доске мы **пишем** мелом.
a. write b. are writing c. have been writing

38. Не ходите в ту аудиторию. Там студенты нашей группы **пишут** контрольную работу.

a. write b. have been writing c. are writing

39. How long ... you learning English?
a. are b. have been c. is

40. What ... you doing now?
a. are b. have been c. had

Ключи

1a, 2b, 3a, 4b, 5b, 6c, 7a, 8b, 9b, 10b, 11d, 12c, 13e, 14a, 15b, 16g, 17f, 18a, 19b, 20c, 21c, 22a, 23b, 24a, 25b, 26c, 27b, 28c, 29a, 30c, 31b, 32b, 33a, 34c, 35c, 36c, 37a, 38c, 39b, 40a.

3. 2 Passive Voice

К каждому вопросу даны несколько вариантов ответа. Выберите тот, который считаете правильным. Если Вы затрудняетесь с ответом, просто пропустите вопрос.

1. The room ..... later.
a) will clean b) will be cleaned c) has been cleaned

2. This is a large hall. Many parties ..... here.
a) are held b) are being held c) has been held

3. The book ..... by Hardy.
a) wrote b) was written c) was wrote

4. A new supermarket ..... next year.
a) will be built b) will built c) is building

5. Many accidents ..... by dangerous driving.
a) caused b) are caused c) have been caused

6. A famous architect ..... the bridge.
a) was built b) built c) have built

7. A decision ..... until the next meeting.
a) has not been made b) will not made c) will not be made

8. Not much ..... about the accident since that time.
a) has said b) said c) has been said

9. This situation is serious. Something must ..... before it's too late.
a) do b) be done c) have done

10. The Earth's surface ..... mostly ..... with water.
a) is ... covered b) was ... covered c) has ... been covered

11. Over 57 million students ..... in American schools which range from kindergartens to high schools.
a) were enrolled b) are enrolled c) has been enrolled

12. A new book ..... by that company next year.
a) will publish b) will be published c) is publishing

13. Detroit ..... Motown in the past.
a) was called b) is called c) called

14. A prize ..... to whoever solves this equation.
a) will be giving b) will be given c) gives

15. It's a big company. It ..... two hundred people.
a) is employed b) employs c) employing

Ключи

1-b, 2-a, 3-b, 4-a, 5-b, 6-b, 7-c, 8-c, 9-b, 10-a, 11-b, 12-b, 13-a, 14-b, 15-b.

3.3 Неопределенные местоимения.

1. There were ... of my friends there.
a) something b) some c) somebody
2. Well, anyway, there is ... need to hurry, now that we have missed the train.
a) no b) some c) any
3. Have you ever seen ... of these pictures before?
a) any b) anything c) some
4. There is ... water in the kettle: they have drunk it all.
a) some b) anything c) no
5. There were ... fir-trees in that forest, but many pines.
a) no b) some c) something
6. We could not buy cherries, so we bought ... plums instead.
a) any b) some c) no
7. I saw ... I knew at the lecture.
a) anybody b) nobody c) some
8. Do you really think that ... visits this place?
a) anybody b) some c) anything
9. I have never seen ... laces their boots like that.
a) something b) someone c) anybody
10.I haven't seen him ... .
a) somewhere b) anywhere c) nowhere
11. I know the place is ... about here, but exactly where, I don't know.
a) somewhere b) somebody c) anywhere
12. Did you go ... yesterday? - - No, I went ... , I stayed at home the whole day.
a) something b) anywhere c) anything
anywhere nowhere where
13. Can I have ... milk? - - Yes, you can have ....
a) any, some b) no, any c) some, some
14. Will you have ... tea?
a) anything b) some c) something
15. Give me ... books, please. I have ... to read at home.
a) some, nothing b) any, anything c) some, something
16. Put ... sugar in her tea: she does not like sweet tea.
a) some b) anything c) no
17. Is ... the matter with you? Has ... offended you? I see by your face that ... has happened.
a) something b) anything c) nobody
nothing anybody any
anybody something anywhere

18. We did not see ... in the hall.
a) anybody b) someone c) any
19. ... was present at the lesson yesterday.
a) anybody b) everybody c) every
20. He is busy. He has ... time to go to the cinema with us.
a) some b) something c) no
21. Do you need ... books to prepare for your report?
a) something b) anything c) any
22. Have you ... questions? Ask me ... you like, I shall try to answer ... question.
a) any b) something c) some
anything any something
every everything no
23. ... liked that play: it was very dull.
a) everybody b) nobody c) anybody

Ключи.
1-b, 2-a, 3-a, 4-c, 5-a, 6-b, 7-a, 8-a, 9-c, 10-b, 11-a, 12-b, 13-c, 14-b, 15-a, 16-c, 17-b, 18-a, 19-b, 20-c, 21-c, 22-a, 23-b.

2.3 Оценочные материалы для проведения промежуточной аттестации

Зачет

Зачет выставляется на основе фактически сданного текущего материала 1 семестра.

Оценивание производится по традиционной шкале: «зачтено» и «не зачтено».

«Зачтено» – теоретическое содержание учебного материала освоено студентом в полном объеме, без пробелов, необходимые практические навыки в основном сформированы, однако они могут быть недостаточными; перевод текста выполнен, хотя некоторые ответы могут содержать лишь незначительные ошибки; качество выполнения оценено числом баллов, близким к максимальному,

«Не зачтено» - теоретическое содержание материала освоено частично, необходимые практические навыки работы с текстом не сформированы, большинство заданий не выполнено, либо качество их выполнения очень низкое.

Практика устной речи

Текст. The place of algae in agriculture: policies for algal biomass production

Algae are simple, photosynthetic, generally aquatic organisms that, like plants, use energy from sunlight to sequester carbon dioxide (CO2) from the atmosphere into biomass through photosynthesis. Plants evolved from ancient algae ancestors, and the photosynthetic machinery in both plants and algae originally came from the same source: cyanobacteria. Although algae and plants differ in many ways, the fundamental processes, such as photosynthesis, that make them so distinguished among Earth's organisms and valuable as crops, are the same.

Certain strains of algae have been used for anthropogenic purposes for thousands of years, including as supplements and nutraceuticals and in the fertilization of rice paddies (Tung and Shen 1985). As early as the 1940s, other strains were identified as possible fuel sources because of their ability to produce fuel or fuel precursor molecules. Large-scale production and cultivation systems, including photobioreactors and outdoor open ponds, were developed in the early 1950s in the U.S., Germany, Japan, and the Netherlands. By the onset of the U.S. Department of Energy's (DOE) aquatic species program (ASP) in the U.S. in 1980, various species of microalgae and cyanobacteria were being produced and farmed on commercial scales

around the world, and had been for over 20 years, mostly for the health food and nutritional supplement industries.

Microalgae have also been identified as attractive sources of biofuel because different species can produce a variety of fuel products. Various microalgal species have the ability to produce large quantities of lipid while sequestering CO2, particularly neutral lipids in the form of triacylglycerol (TAG), which can be converted to fatty acid methyl esters (FAMEs), the main components of biodiesel, through trans-esterification, or refined into other fuel constituents. Total lipids and other biomass constituents can be converted into crude oil alternatives through thermochemical processes such as hydrothermal liquefaction. Microalgal carbohydrates can be fermented into ethanol, and some species can produce biohydrogen. In addition to their diversity of products, microalgae are attractive as fuel sources because many species grow relatively fast compared to terrestrial plants and can be grown on brackish or saline water, thus avoiding the use of unsustainable quantities of freshwater, an increasingly limited resource.

Algaculture, or the farming of algae, merges the requirements of traditional terrestrial plant agriculture such as sunlight, water, CO2, nutrient inputs, and harvesting systems with additional aquaculture requirements such as self-contained aquatic systems, water quality, and waste disposal/recycling. Because of their capability to produce commodities that span multiple markets, including those of health food, nutraceuticals, pharmaceuticals, animal feed, chemicals and energy, algae are uniquely versatile crops. These diverse metabolic capabilities are due, in part, to the diversity of strains found within the algal lineage. Algae strains grown for food purposes, such as Spirulina, have a starkly different metabolic profile from strains grown for energy, such as Scenedesmus. The diversity of their end products, and their cultivation using both agriculture and aquaculture practices make algae unique among other agricultural products.

Текст 2.Gastropoda

Gastropoda, the largest molluscan class, with 75 000 living and about 15 000 fossil species, includes some of the most common invertebrates: limpets, abalones, periwinkles, conchs, whelks, slugs and snails. Gastropodaare harvested and cultured for food worldwide. Certain freshwater snails are important disease vectors, acting as intermediate hosts for liver and blood flukes that parasitize humans (eg, schistosomiasis). Snail shells are prized for their form and beauty. Gastropods occupy more habitats and represent more species than any other molluscan class. This extensive adaptive radiation was made possible through 3 major changes from the molluscan ancestral plan: development of a complex head with elaborate receptors and nervous system; coiling of shell; and torsion, involving a 180° twisting of the shell and visceral mass over the lower body section.

Coiling and torsion evolved independently. Coiling probably preceded torsion, converting the ancestral shell from a simple, flattened shield to a fully protective retreat. The earliest form of coiled shell (found only in extinct species) was planospiral, i. e, each spiral lying outside of the preceding one in the same plane (eg, like a coiled rope). This large, unwieldy and probably unbalanced shell was improved by evolution of asymmetrical coiling about a central axis. The new shell had its centre of gravity squarely over the body midline. The outward projection of the largest whorl of the shell creates the mantle cavity (lined with the shell-secreting membrane), which houses gills and sensory equipment for testing water quality and receives discharge of kidneys, gonads and rectum.

Torsion, thought to have occurred after the evolution of a planospiral shell, formed the gut and nervous system into a U-shape and brought the mantle cavity from its posterior position to an anterior one. Torsion occurs in the larval stage of living gastropods. Its significance in gastropod evolution is disputed. Some argue its importance to larvae (protective withdrawal into mantle cavity); others, to adults (enhanced respiratory stream). An important consequence of the shifting of the mantle cavity to the front was the potential for fouling the head region with rectal and kidney wastes. The solution, involving redirection of water flow for respiration, resulted in considerable modifications of shell design. For example, the perforated shells of abalone and

keyhole limpets allow a unidirectional flow of water through the mantle cavity: in over the head, past the gills, then past the rectal and kidney outlets, exiting via the shell holes.

Gastropods are separated into 3 subclasses. Prosobranchia, the largest, is mainly marine and includes gastropods having full torsion, eg, limpets, abalones, whelks, periwinkles and conchs. Among members of this subclass exploitation of habitats and food types has been extensive; some even live as parasites. Foodstuffs include dead organic material, microscopic phytoplankton, seaweeds and animal prey (including fish). In snails the food-procuring device is the radula, which in cone shells has evolved into poisonous barbs that can be thrust into prey. Therefore, certain cone shells can be highly toxic to humans.

The second subclass, Opisthobranchia, is almost entirely marine, with some 1100 species including sea slugs, sea hares, sea butterflies and bubble shells. Opisthobranchs have undergone detorsion in their evolution, shifting the mantle cavity to the side. Associated with this has been a tendency towards reduction or loss of shell and mantle cavity, and a loss of gills. Shell loss may have led to evolution of defences characteristic of opisthobranchs, eg, ability to swim, acid secretion, protective internal spines (spicules), camouflage coloration, and secondhand use of stinging cells seized intact from coelenterate prey.

The third subclass, Pulmonata[Lat, "lung"], probably evolved from the Prosobranchia. Pulmonates include some 20 000 species of land snails and slugs, freshwater snails, and a few marine snails, having in common a loss of gills and conversion of mantle cavity into a lung. This highly successful group includes numerous crop and garden pests.

Текст 3. Effect of Mariculture on marine and coastal biodiversity

All forms of mariculture affect biodiversity at genetic, species and ecosystem levels, which results in the supply of ecosystem goods and services. Mariculture can change, destroyhabitat, disrupt trophic structures, spread diseases and reduce the genetic capability. The by-products of the mariculture systems like particulate organic matter, nitrogen, phosphorus, remains of antibiotics, pesticides, and hormones move into the water column. The genetic effects of mariculture are wide-ranging and highly important for biodiversity. The major effects of mariculture on marine and coastal biodiversity are summarized below.

Effluent discharge

Mariculture activities release untreated nutrients, chemicals, feed materials, antibiotics and pharmaceuticals into marine ecosystem. This will lead to degenerated water quality in the shallow water bodies and high concentrated production areas. Nutrient loading from the culture systems will affect the biogeochemistry of the habitatsmaking it toxic to the fish and shellfish.

Habitat modification

Large areas of mangrove and coastal areas have been converted to shrimp and fish ponds. This conversion results in the loss of ecosystem services provided by the mangroves such as nursery habitat, coastal protection, flood control, sediment trapping and water treatment. The loss of mangrove will affect the catch of the mangrove dependent fish species. As mangroves are closely related to the Coral reefs and sea grass beds, the change in the mangrove area will havea deleterious effect on the coral and sea grass ecosystem. Culturing of milkfish and shrimp often involves changing mangroves and salt swamps, the ecosystem that offers many key services such as erosion control, flood control, trapping of sediments and dispensation of wastes. As the culturing intensifies natural habitats will be destroyed and can in turn result in biodiversity imbalance.

Use of wild seed to stock mariculture

The use of wild collected seeds for the mariculture operations in extensive, pond and cage culture activities will have consequences in the wild fisheries. Wild collected seeds are used in the milkfish culture in the Philippines and Indonesia, tuna in South Australia, shrimp in Asia and

Latin America, eels in Europe and Japan. The fry collection results in the loss of other frys collected along with the target group and it may be some times a higher magnitude than the targeted group. The fry removed from the wild will ultimately have an impact on the wild production of the species.

Increased predation on wild fish and other organisms

Aquaculture in general can have incidental predation effects on other non-target organisms. A variety of piscivorous birds like terns, cormorants, pelicans, gulls, egrets, heron, and kingfisherare commonly aggregate around the culture areas.

Biological Pollution

The mariculture affects the wild and farmed fish through biological pollution. Escape or the accidental release of fishes into the wild from aquaculture farms,has an adverse impact on native species and ecosystem, it paves wayto a major environmental apprehension. Introduction of exotic species and the escape of genetically modified fish samples which are used for aquaculture purposes or laboratory testing result in competition and predation of wild fish varieties. As a result of the introduction many indigenous varieties of fishes have been replaced by exotic varieties. The Atlantic salmon the dominant Salmon species farmed, frequently escape from farms. Farm escaped fishes may hybridize with wild and alter the genetic make-up of the wild populations which results in the decline of many locally endangered species.

Текст 4. Fish Farming

Fish farming is a form of aquaculture in which fish are raised in enclosures to be sold as food. It is the fastest growing area of animal food production. Today, about half the fish consumed globally are raised in these artificial environments. Commonly farmed species include salmon, tuna, cod, trout and halibut. These “aquafarms” can take the form of mesh cages submerged in natural bodies of water, or concrete enclosures on land.

According to the United Nations Food and Agriculture Organization, roughly 32% of world fish stocks are overexploited, depleted or recovering and need of being urgently rebuilt. Fish farming is hailed by some as a solution to the overfishing problem. However, these farms are far from benign and can severely damage ecosystems by introducing diseases, pollutants and invasive species. The damage caused by fish farms varies, depending on the type of fish, how it is raised and fed, the size of the production, and where the farm is located.

One significant issue is that—rather than easing the impact on wild populations—the farms often depend on wild fish species lower on the food chain, like anchovies, in order to feed the larger, carnivorous farmed species. It can take up to five pounds of smaller fish to produce one pound of a fish like salmon or sea bass. Overfishing of these smaller “forage” fish has repercussions throughout the ocean ecosystem.

As is the case with industrial animal farms on land, the fish are often housed in unnaturally crowded and cramped conditions with little room to move. Fish may suffer from lesions, fin damage and other debilitating injuries. The overcrowded and stressful conditions promote disease and parasite outbreaks—such as sea lice—that farmers treat with pesticides and antibiotics. The use of antibiotics can create drug-resistant strains of diseases that can harm wildlife populations and even humans that eat the farmed fish.

Escaped fish introduce yet another threat into the environment. Each year, hundreds of thousands of fish escape farms and threaten the genetic diversity and survival of native species. High stocking densities result in a significant amount of pollution from fish excrement and uneaten food, which in turn lead to poor water quality high in ammonia and low in oxygen. Outdoor fish farms can also attract predatory marine animals, such as sea birds and sea lions, who are sometimes poisoned or shot by aquafarmers for eating the fish.

Despite evidence to the contrary, it is still a common misconception that fish do not feel pain. Slaughter methods in the aquaculture industry are appalling. Little to no attention is given

to the suffering of the animals and most are fully conscious during slaughter, which can take many minutes. Some species, such as salmon in the United States, are also starved for many days to empty the gut before they are sent to slaughter. Fish are most often not stunned and are killed by bleeding out, being hit on the head repeatedly, suffocating or freezing. In the US, as with many other countries, there are no regulations to ensure the humane treatment of fish.

Years of unregulated and underreported catches of bluefin tuna in the Mediterranean Sea and Atlantic Ocean are threatening the existence of this severely overfished species. To meet the high and growing demand for sushi in Japan and elsewhere, ranching of bluefin tuna is becoming a popular industry and is exacerbating the problem. Fisherman use longlines and purse seines to catch the tuna before they reach breeding age and have time to reproduce. They are then kept in seafarms for 3–6 months and fattened with thousands of pounds of smaller wild-caught fish before being killed and exported.