



The Adventures of Starry, The Brave Sturgeon

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The International Association for Danube Research (IAD) is the oldest NGO in the Danube Region, founded in 1956 to promote transboundary research and cooperation in the field of freshwater science. Since 2000, one of its key topics is sturgeon research and protection. The continuous decline of wild populations was alarming, and conservation measures were gradually initiated by environmental NGOs and the Danube riverine countries: the elaboration of a joint action plan for their recovery, the ban of commercial sturgeon fisheries, and supportive stocking programmes.

The Institute for Integral Development and Environment (ICRO – Inštitut za celostni razvoj in okolje) is a Slovenian NGO, founded in 1996 to promote sustainable development through environmental planning and design, as well as through environmental education and awareness actions. Since 1997, it has been leading the Water Detective programme, which includes various activities related to water education focused on primary school children: publications for teachers and children, workshops, seminars, and similar.

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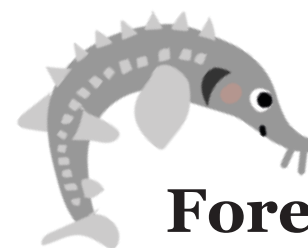
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Foreword

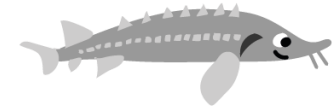
At the beginning of March, in a small sturgeon farm located on the bank of a large river, a little stellate sturgeon was born. His name was Starry, and he was a very friendly fish. For a few months, he grew up at the farm surrounded by his older brothers and sisters, swimming in a large basin with clean water and good food, while people took care of them, and lots of visitors came to play with them.

Why is he so important, and why do we want to share his story with you? The sturgeons face severe dangers and need our support to survive. We hope that Starry's amazing journey to the river and the sea, and his many encounters along the way, will help you better understand how the sturgeons live and perhaps also change your perception about the way you could protect them in the future.

Would you like to help us to save them?

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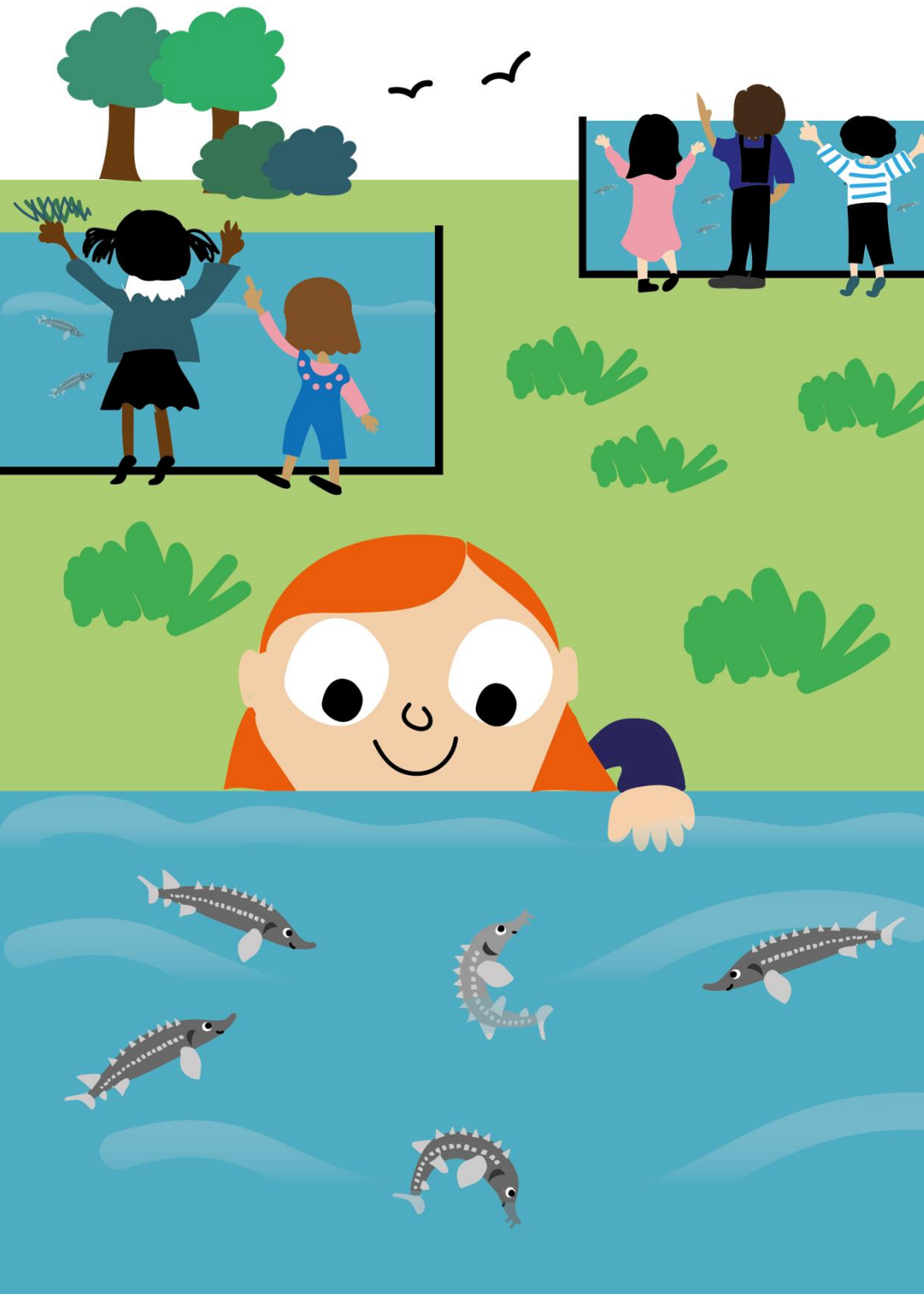
Starry swims to the sea



Three months have passed since the little sturgeon was born. He was playing in a large basin and was particularly happy when children came to visit the farm and played with them. The kids loved his spectacular look, with light grey colour and a nice line of starry scutes – bony shields – along his sides. He liked their joy and enthusiasm, and quickly learned how to attract their attention: he would swim near the surface, taking food from their little hands, which made the children cheer every time. Making them smile and laugh was his biggest reward!

One day, a rumour started to spread in the basin: the whole group would move to the river. Starry was scared since the basin was the only place he knew, where he felt safe and could play all day long. ‘Don’t be afraid! Rivers and seas are our real home. Besides, you won’t be alone. We’ll all travel together’, his older brother Andy told him.

Reassured, Starry swam near the edge of the basin, where a little girl was talking to her father: ‘Daddy, look how cute they are! Why must they leave the farm? I’m going to miss them!’

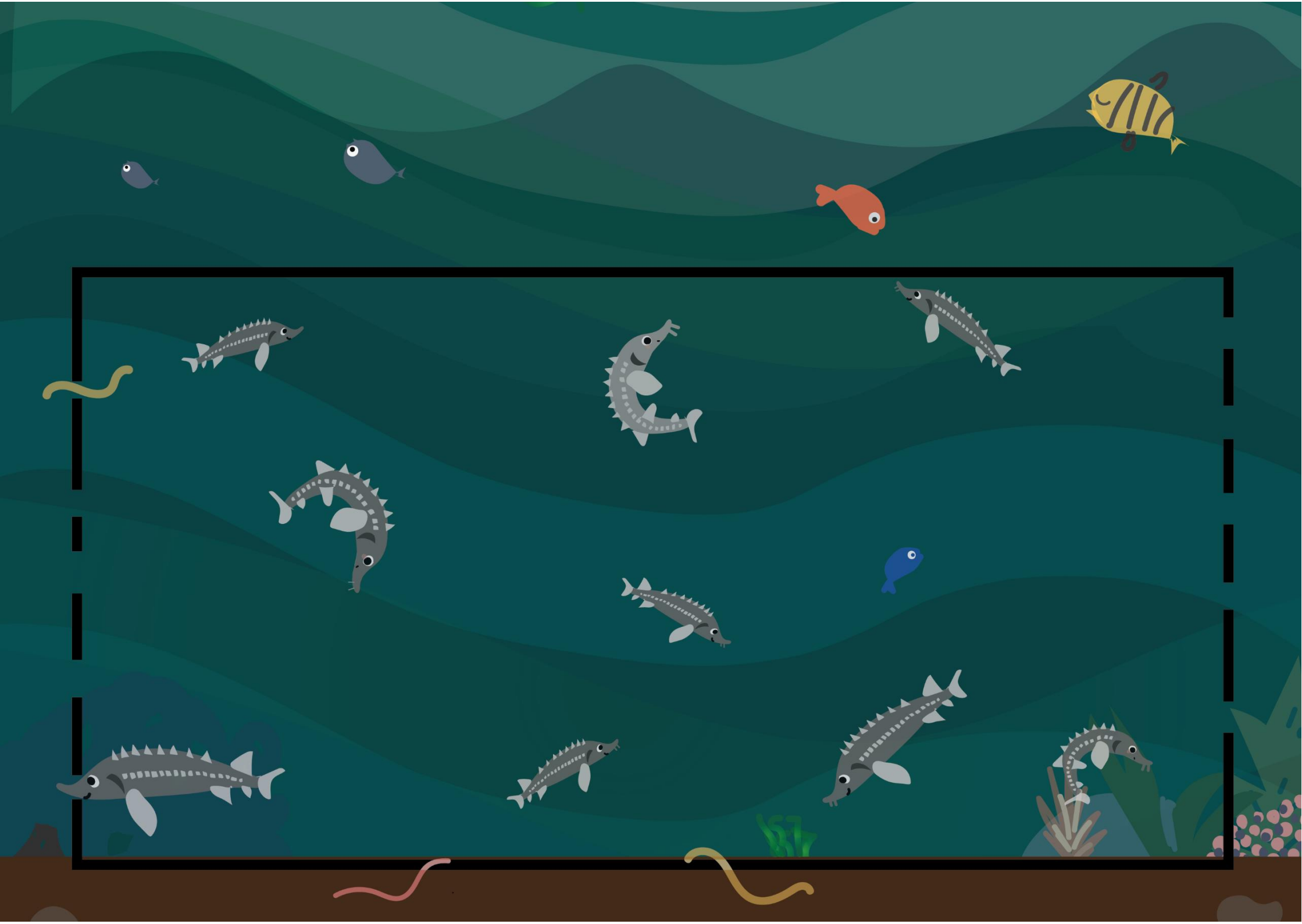


‘They are part of a rescue program’, her father replied. ‘The number of wild sturgeons is very low, so young sturgeons are raised and released into the river to help wild populations to recover.’

Even though Starry was not so happy about leaving the farm, he understood that he and his brothers and sisters had an important role to play. He was thinking: ‘We will help the wild populations of sturgeons? I’m going to be A HERO!’

‘Sturgeons are endangered species, too many of them are fished for their eggs, called “caviar”, the girl’s father continued. But Starry wasn’t listening anymore. He was already swimming away to join his brothers to find out more details about this adventure.

The next morning, the group of young sturgeons was moved to a very large perforated container and placed in the river. Suddenly, Starry was surrounded by fast-flowing water, shining in greenish colours. Tiny aquatic organisms were passing freely through the holes in the container. The water was bringing many interesting new smells, and even its taste was very different than what he knew from the basin. The container was safely placed on the river bottom, where the light was nearly absent, and the water current was not so strong. Starry soon discovered that his nose can be of great help to detect food and get oriented in the dark. And since they had lots of space to play in, soon several contests started: who swims faster against the current, who finds more food, who identifies more smells. It was so much fun in their new playground!



A few days later, the container was opened, and the sturgeons were free to swim in the river. In just a few seconds, Starry was swept away by the strong current and lost sight of his brothers and sisters. The water was cloudy and turbulent, so he tried to swim as fast as he could towards the riverbank, where the water flow was much slower. A black shadow dived near him, and in the next second, he was swallowed by a large bird. The bird did not seem to like him much, as he was spat out almost instantly, before being hurt. Puzzled by this adventure, Starry tried to find a shelter near the riverbank, between the tree roots, to recover and catch his breath.

A friendly fish was observing the struggle of the young sturgeon. 'You're very brave. Good of you to escape from the cormorant!'

Still out of breath, Starry looked at the dark-coloured fish that was approaching him. 'Cormo-what?' Starry asked, still dizzy.

'The black bird that caught you was a cormorant. These are fish-eating birds, so it was impressive that you could escape alive. How did you do it?' the fish asked.

'I have no idea. Probably she didn't like the bony scutes I have on my sides. I guess, they acted as an armour.'

It is my first day of swimming freely in the river. I was supposed to travel to the sea with my brothers and sisters, but I've lost them. Have you seen them?', Starry asked.

'I'm sorry, I did not see your family, but if they went along with the current, they are probably far downstream. If you want, I can travel with you for a while. Maybe we'll meet them on the way.'

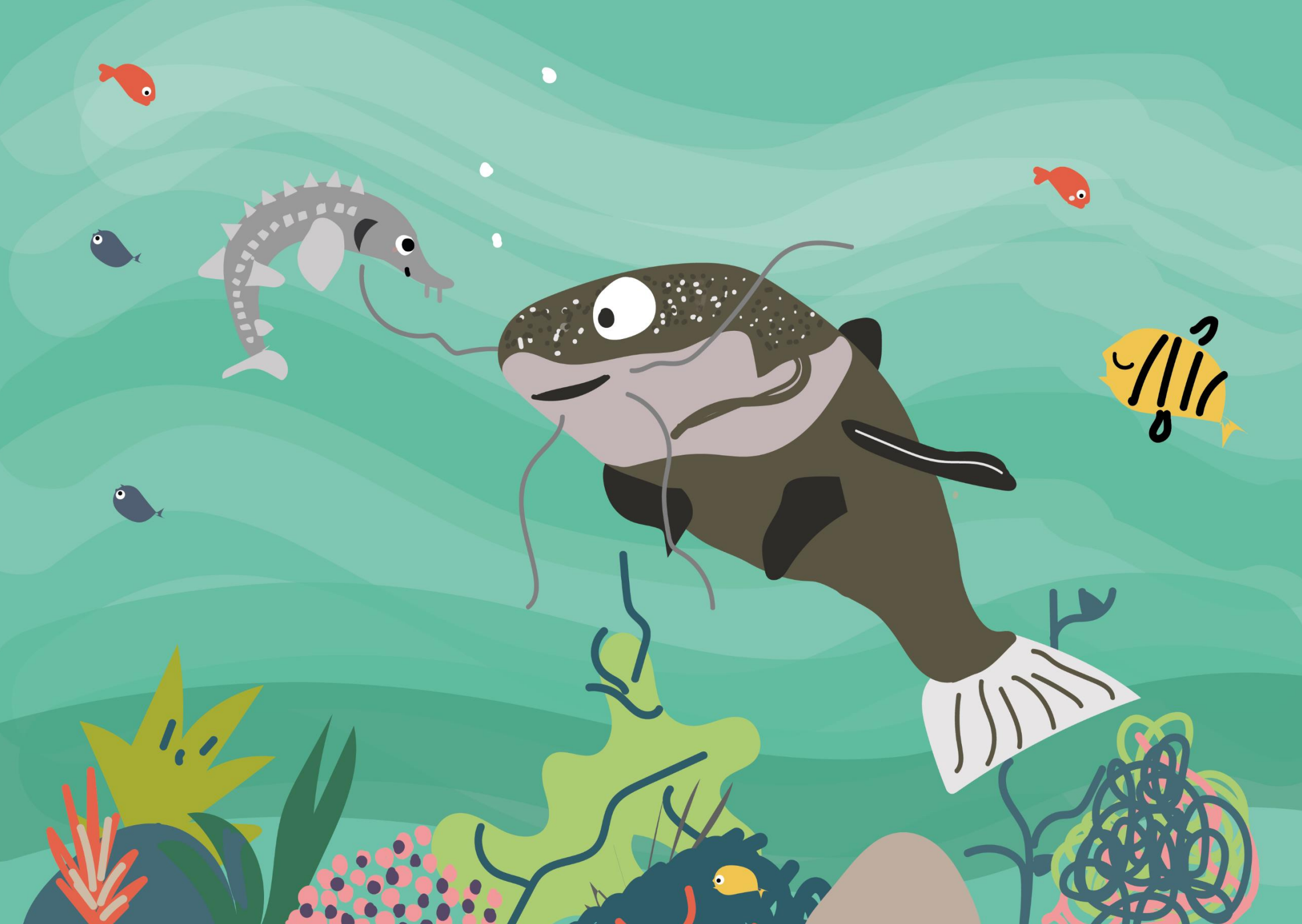
'The easiest way to reach the sea is to let the river guide you – it flows into the sea and is by far the fastest way you can find your family,' the fish added. 'Are you hungry?'

'Oh, yes, I would really love to eat something! My name is Starry, by the way, I come from the farm nearby, and I'm a stellate sturgeon. And you?', the little sturgeon asked.

'My name is Kenny, I'm a catfish, and I live here, in the river. Let's go and grab something to eat, and then we'll try to find your family!'

The two fish had a small snack near the riverbank and then swam to the middle of the river, where the current was the fastest. The water carried them further downstream, while Starry was enjoying the ride, swimming up and down, and cheering when the flow was very rapid.





Starry reaches the sea and meets new friends



After a few hours of swimming, Starry felt tired and started to look for a place to rest. Kenny saw that his little friend was slowing down and encouraged him: ‘The current is very strong now. We’re really close to the sea, and soon you’ll be able to rest.’ ‘Really?’ Starry was visibly relieved. ‘The water tastes different, but I didn’t know that we were so close to the sea.’

‘Indeed, the water is a bit saltier, and our travel together will end soon. I’m a freshwater fish, and I can’t accompany you further. Unlike yours, my body is not adapted to seawater. In a few minutes, you’ll reach the end of the river, and you will be in the sea. Keep swimming along the seacoast, and you’ll be fine. I’m sure you will find your family.’

‘Thank you so much. It was fun to swim together! You are a real friend. I hope to meet you again someday!’, said Starry. ‘Bye, Starry. Good luck at sea!’



While Kenny started to swim back up the river, Starry continued along with the flow, and soon he realized that he had reached the sea: the water became calmer, saltier, much wider and clearer, while the bottom changed gradually from mud to fine sand. He started to swim along the seacoast, looking for something to eat. Soon he found a delicious meal: tiny shrimp-like crustaceans were very abundant near the beach, and they were so tasty. ‘Yummy!’

After a while, he noticed that he was not alone: another sturgeon was swimming towards him. Happy that he will not be alone anymore, Starry turned to the newcomer to greet him, and he was surprised to see that it was a girl. She had a darker colour, which made the star lines along her sides even more visible. Starry could not stop staring at her: she was the most beautiful girl he had ever seen.

‘Hi, I’m Kyra, and I live nearby with my family’, the beautiful girl smiled. ‘Who are you? I haven’t seen you around before.’

Starry felt his heart melting and, for the first time in his life, he could not find his words: ‘Starry. I come from a far-away farm.

I lost my brothers and sisters, and now I’m looking for them. Have you seen them?’

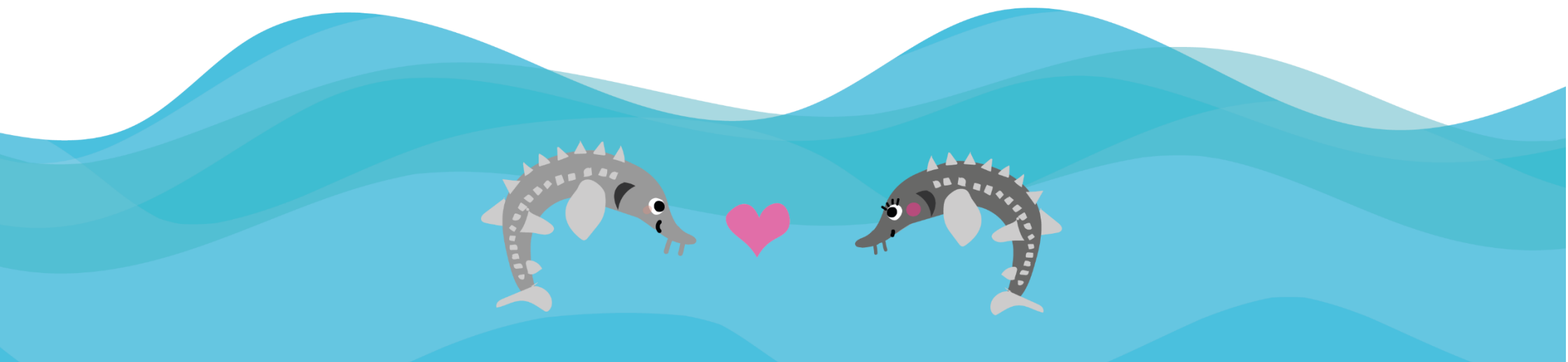
‘Nope, I didn’t see your relatives’ the girl answered. ‘But I can guide you to our marine sanctuary where there are more sturgeon families. Perhaps somebody has met them. We should go soon, this place is not safe’, said Kyra.

‘Thank you so much. Let’s go!’

The two little sturgeons started to swim towards the protected area, and soon they entered the marine shelter. Kyra presented briefly the surroundings: feeding and resting grounds, places where they can play and swim safely, and places where he can meet other sturgeon families.

‘First, we should ask my family’, Kyra added.

Near a pile of rocks covered by aquatic plants, Kyra slowed down and invited Starry to enter. ‘Granny, I’m home, and we have a guest!’ Kyra announced cheerfully. ‘Great! You’re right on time. The whole family will come soon, and they are going to be happy to meet your friend.’





A few minutes later, the whole family gathered around the table, enjoying the dinner and discussing Starry's story. 'It's amazing! You look exactly like us, but you're born on a farm and released into the wild? That's very unusual!'

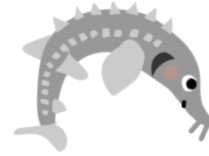
'I heard that we're part of a rescue program, planned to help wild sturgeon populations. Look,' he proudly showed his fin, 'I also have a little wire attached to my fin, which shows where I come from.'

'Interesting,' Kyra's father replied and continued: 'Marine sanctuaries, like ours, were also established to protect endangered species. It is safe to live here, but once you swim out of this area, you risk being trapped in fishing nets or being injured by boats or jet-skis.'

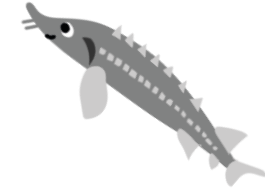
'So, you travelled with your brothers and sisters, and then you got lost?' Kyra's mother asked.

'No, I was lost as soon as we were released into the river. The water current was very strong, and we were separated. By any chance, have you perhaps seen a new group of sturgeons here?', Starry asked.

'I don't know if these are your brothers, but today I heard the Beluga family mentioning a new group swimming near the edge of the marine sanctuary. You should stay with us tonight, and tomorrow morning we can go together and check if they're your relatives. We should warn them to move to the inner part of the protected area to avoid danger.'



Starry finds his relatives



Tired after his long journey, Starry fell asleep almost immediately. He woke up when Kyra shook his fin, guiding him gently to the exit. ‘Good morning! Sorry to wake you up so early, but we have a long day ahead, and it is better to leave now.’

Starry left with Kyra and her mother. Along the way, they started to explain to him that he should be careful: ‘At sea, you can encounter fish-eating birds, fishing vessels, abandoned nets, jet-skies, scuba-divers, oil patches from the marine platforms and maritime transport, plastics, and many other dangers that you should try to avoid!’

Time passed quickly, and soon they arrived at the edge of the protected area, where the new group was spotted the day before.

‘Kyra, take care not to exit the sanctuary’, said her mother. ‘While you swim around looking for Starry’s brothers, I’ll visit the Beluga family, and check if they know where to find the new group.’ ‘Ok, mom, don’t worry!’



The two young sturgeons started to explore the area: many little crabs, snails, worms, and fish were moving around, it was such a wonderful symphony of colours! Starry felt like he was in paradise: he was swimming next to the most beautiful girl, the place was charming, if only he could find his family! Suddenly, he spotted some interesting creatures, with transparent bodies, pulsating in the water. 'What are they?' Starry asked, surprised. 'They're so graceful!'

'Jellyfish,' Kyra answered. 'Better stay away, their tentacles are poisonous.'

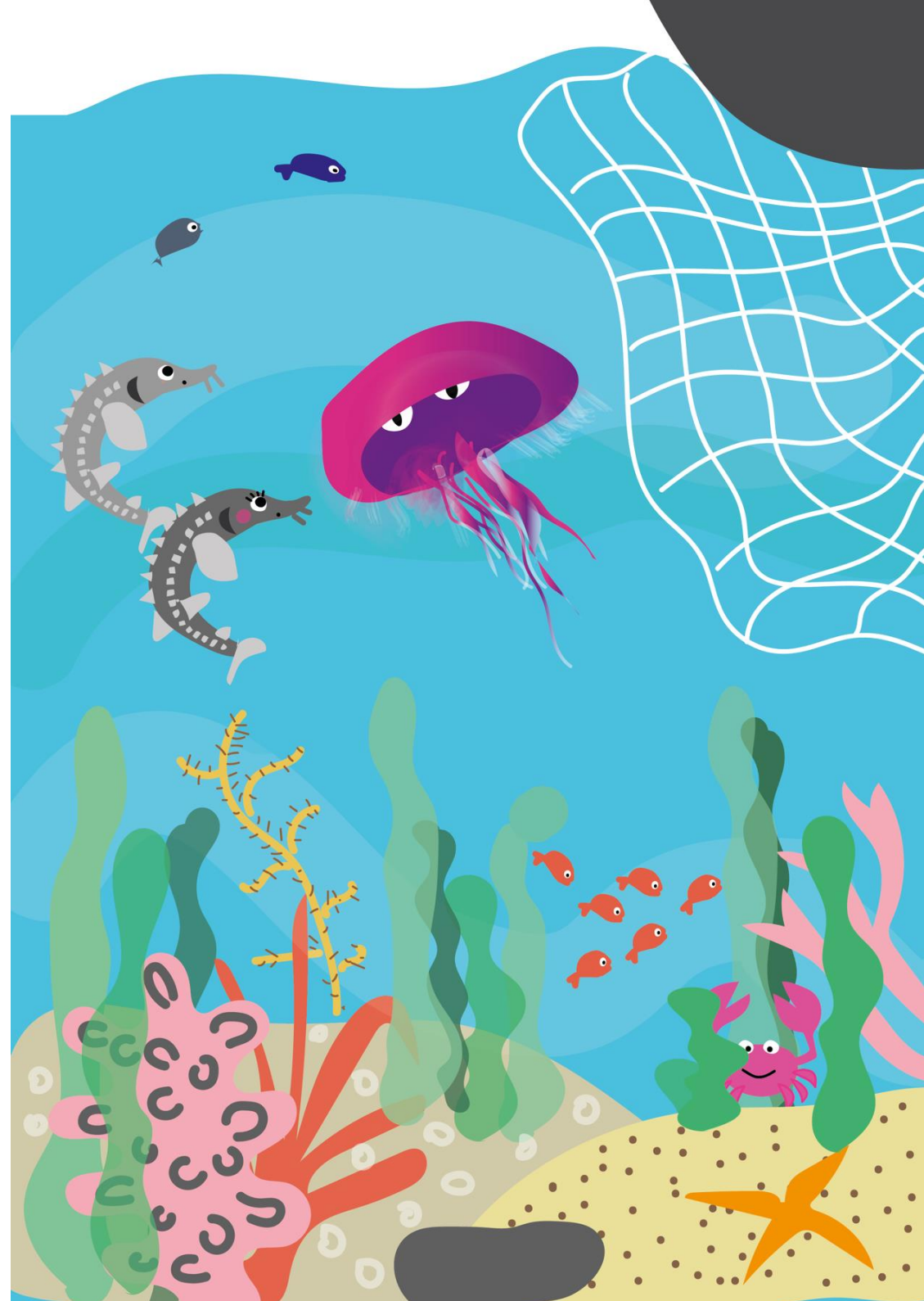
A few metres away, a net was floating in the water. Starry wanted to impress the beautiful girl, and without knowing what it is, he swam into it.

'DON'T!' Kyra warned him, but it was already too late. He was trapped in the net.

Surprised and scared, he started to pull himself out. Kyra was so shocked, she could not move. Starry was trying hard to escape, but he was too small to succeed. A few metres away, a large crab was sitting on a rock, and he rapidly understood that the little fish is in serious danger. 'DON'T MOVE! They will know you are here, and they will pull out the net. I'll try to cut the rope with my pincers.'

Soon, Starry was free again. Kyra embraced him, happy that he was safe: 'You scared me so much! Never ever swim into a fishing net! This is one of the most dangerous things you can find', she said. 'A few years ago, we lost my grandfather after he got caught in such a net.'

'Don't worry, I'll never forget this terrifying experience', said Starry.



‘Please, don’t say a word to my mom. She warned us to be careful’, Kyra added. The two little sturgeons thanked the crab for saving Starry’s life and swam away from the dangerous trap.

‘Hey, kids, where are you?’ Kyra’s mother was approaching with good news.

‘The group was here yesterday, and the Beluga family advised them to go near the shipwreck, a safer place, to find food and shelter. It’s not far, so we can be there in 10-15 minutes.’

‘Oh, I do hope this group is my family!’

Kyra’s mother took the lead, showing the way, and they started to swim faster towards the shipwreck. Starry was looking forward to

finding his family but, on the way, he could not stop admiring the diversity of the sanctuary: so many animals lived there, and the place looked so nice and peaceful! The area seemed great for families, and he was hoping to soon find his relatives and resume the life they had together at the farm.

‘This is the shipwreck’, Kyra’s mother announced. ‘I’ve seen a few members of the new group. Let’s check if they are your family.’

But Starry was already there as he recognized his brothers and sisters: ‘Andy, Alex, Carol, Martin, Ann, it’s so good to see you!’

‘Starry! We’re so happy you’ve made it! We were planning to swim together to the sea, but you disappeared so fast! The water was very cloudy, and we couldn’t find you!’





‘It was difficult at the beginning’, said Starry, ‘but I was lucky to find good friends along the way. Speaking of friends: let me introduce Kyra and her mother. They offered me shelter and guided me here to meet you!’

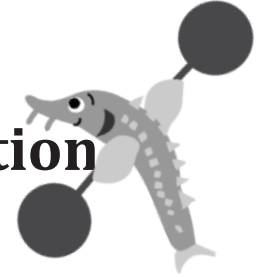
‘Thank you so much for taking care of our little brother!’

‘Starry, we’ll leave you now with your family, but you know where to find us, and you’ll always be welcome!’

‘Thank you very much for all your help! See you tomorrow, Kyra!’

While Kyra and her mother were swimming away, Starry started to share his adventures with his brothers and sisters. They were all listening, amazed by his story, admiring the way their little brother could pass smoothly through all the challenges. ‘Our little hero’, said his older sister Ann, ‘We’re so proud of you.’ With his family around and knowing that they all will be safe in the marine shelter, Starry’s heart was full of happiness. He turned to his brother Andy: ‘You’re right! Our natural home is much nicer, and I look forward to our future adventures!’

Preparing for migration



The years passed safely in the marine sanctuary for the little sturgeon, his relatives, and the other sturgeon families. Starry and Kyra became best friends, spending their time together, and enjoying all the new experiences. The two little sturgeons turned into beautiful young adults, got married and one day, while visiting Kyra’s family, they started to discuss an urgent topic: the spawning migration.

‘This is one of the most important journeys of your life, so you should prepare well before departure’, said Kyra’s grandmother. ‘You’ll leave the safety of the sanctuary and migrate along the river to find proper places to lay eggs and reproduce. On the way, you’ll face many dangers and your strength will be tested like never before. Fortunately, you won’t be alone. Several generations will migrate with you, which increases your chances of success.’

‘How should we prepare?’ Starry asked. ‘The river is so different

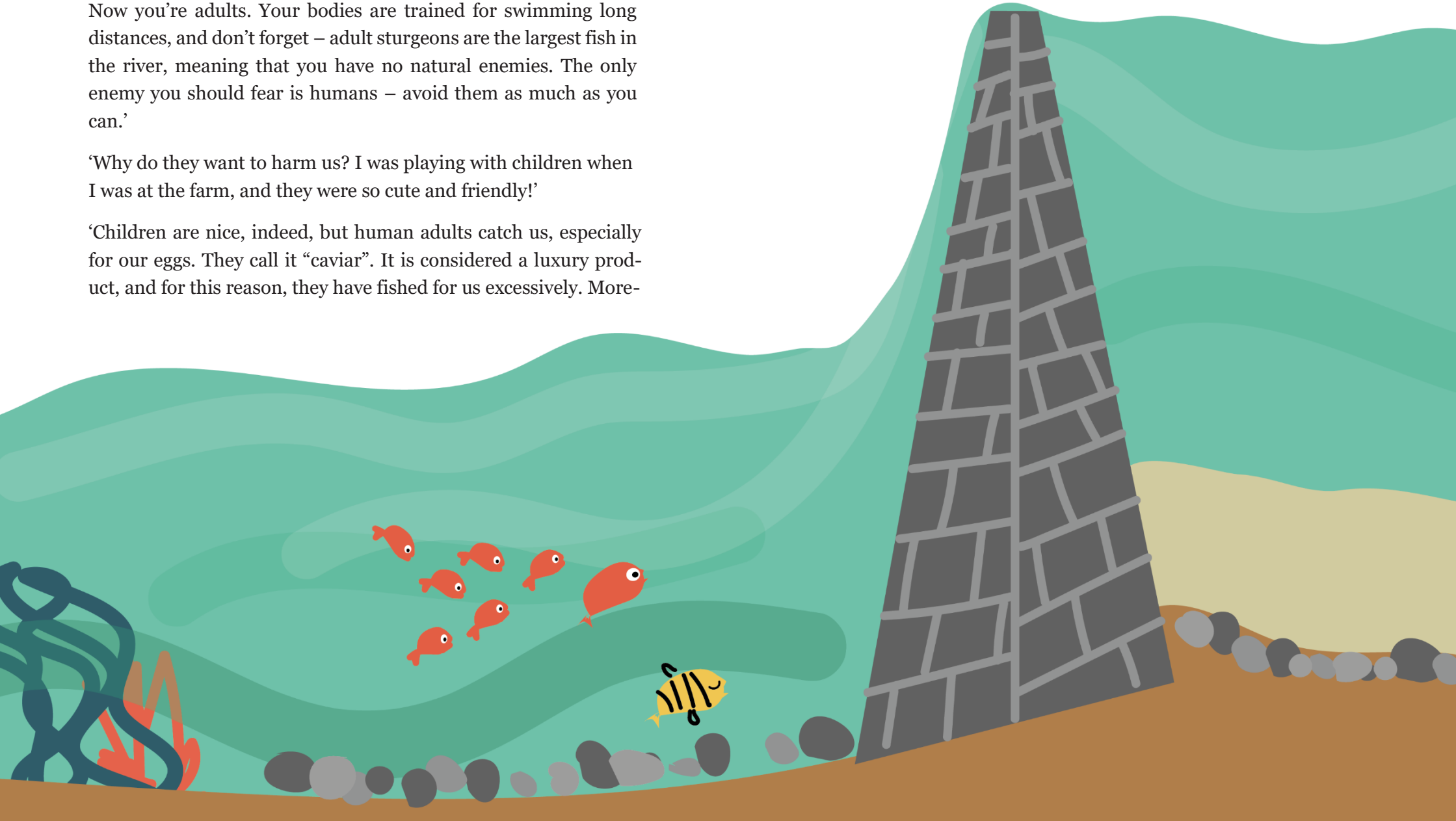
from the sea! I remember the strong currents, turning me upside down, the bird attack, the cloudy water, the smell of the place where we were put in the river, but this seems so far away.'

'You were children at that time. That's why it seemed so difficult. Now you're adults. Your bodies are trained for swimming long distances, and don't forget – adult sturgeons are the largest fish in the river, meaning that you have no natural enemies. The only enemy you should fear is humans – avoid them as much as you can.'

'Why do they want to harm us? I was playing with children when I was at the farm, and they were so cute and friendly!'

'Children are nice, indeed, but human adults catch us, especially for our eggs. They call it "caviar". It is considered a luxury product, and for this reason, they have fished for us excessively. More-

over, they use the river for ships, building hydropower dams, dikes, and channels, so they've blocked our migration corridors and destroyed many of the places we used for reproduction, nurseries, and feeding. It's more and more difficult to find the few remaining sites.'



“Why are they doing this?”, Kyra asked surprised. ‘Don’t they know that all the living organisms in the river depend on these places for survival?’

‘I don’t think that builders and engineers know that they’re destroying our vital places’, Granny replied.

‘But’, Starry remarked, ‘There are also people trying to help us. I was born as part of a rescue programme. People established special farms to produce young sturgeons and place them in the river. They also created marine sanctuaries, like the one where we live!’

‘As I heard, they’ve forbidden sturgeon fishing, but some humans are still doing it! Such people don’t care about our fate and the efforts invested in saving us!’

Starry was thinking out loud: ‘If people would respect the laws and if they would understand that our rescue programme will bring benefit to them as well, we could recover much faster! How can this be done, Granny?’

‘I believe that someday people will understand that our lives depend on access to vital places in the rivers and sea. We need migration corridors to reach the areas where we were born and where we can reproduce. We need more strictly protected areas where no one could harm us, so we can raise our little ones and start the circle of life again. But until that day, please take care! In the river, you are most vulnerable, as you can rarely find shelters!’

‘Thank you so much, Granny!’

‘And eat well before you leave! In the river you’ll be too busy, and you won’t have time for meals!’

Starry and Kyra went to visit Andy, who was ready to leave with the first group, to talk about the proper places where to spawn: ‘I heard that the way to the place where I was born is blocked by a large dam,’ said Kyra.

‘Perhaps we should stop near the farm where we were born. It’s easy to find’, said Starry.

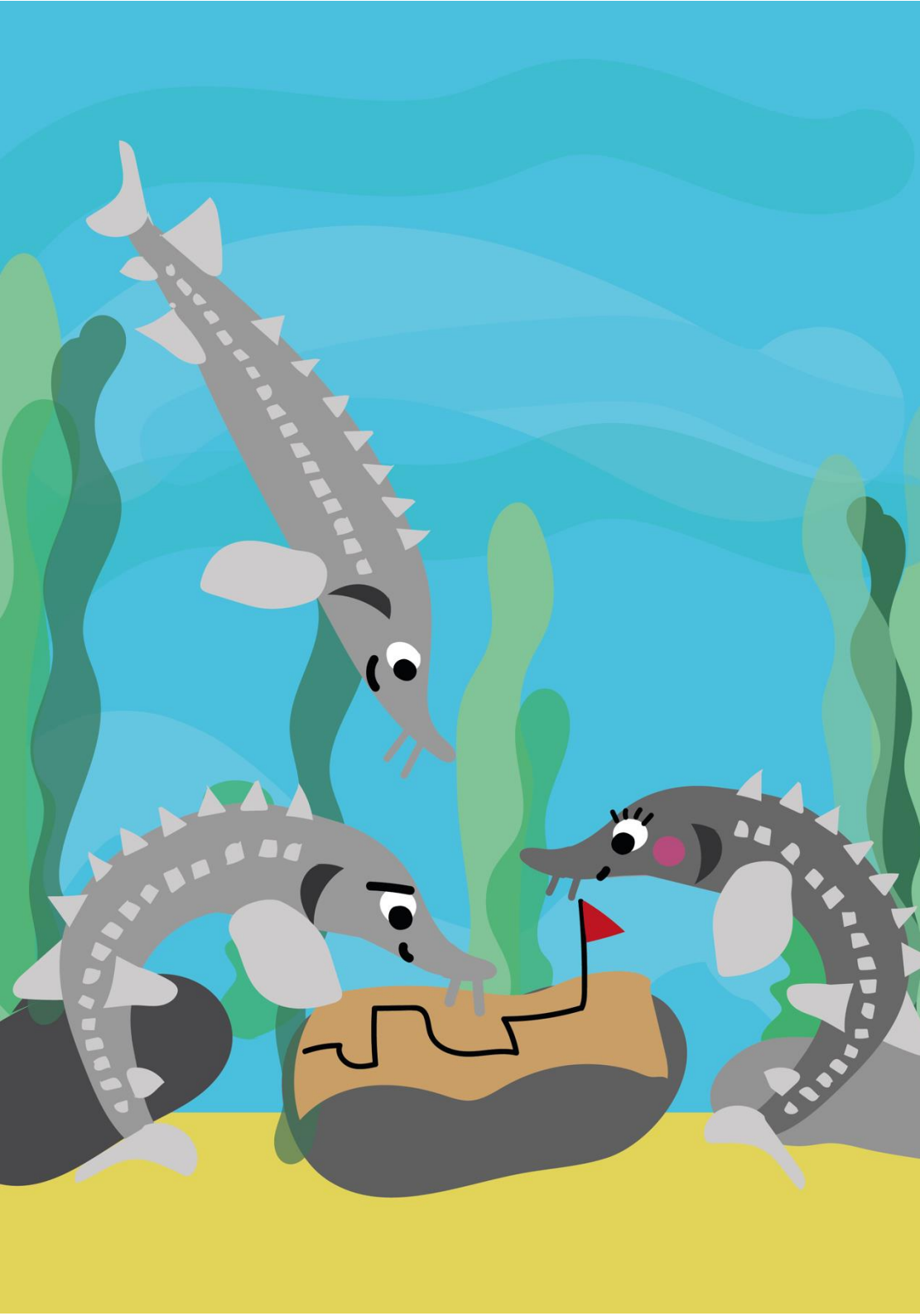
‘An older sturgeon, spawning last year, told me that upstream of the farm there are better places. We need to find water with greater depths, rocky substrate and avoid mud, as this could harm the eggs and the newly born,’ Andy added.

‘Ok, but this means we will need to spend more days in the river. Kyra’s grandmother told us that it will be easier to swim if we stay near the river bottom. I still remember the strong current we had to face in the river. It was nice to travel down to the sea, but this time we’ll need to swim against it.’

‘Let’s hope everything will be ok! When do you plan to leave?’

‘Kyra and I need two more weeks to prepare, we’ll follow with the second group. Good luck with your trip, Andy! See you soon in the river!’

‘Bye, Starry! Bye, Kyra! Stay safe!’



Back to the river

With only two weeks left before departure, Kyra and Starry intensified their training, eating more and swimming all day long. After discussing it again with the family, and considering that people were trying to catch sturgeons especially at night, they decided to travel more during the day, and stay hidden during the night, to have better chances to reach the spawning grounds.

Finally, the big day arrived. At the edge of the marine sanctuary, they met other teams of stellate sturgeons prepared for migration, and the whole group left early in the morning, heading for the river mouth. After a few hours of swimming, Starry felt that the water became sweeter and cloudy, and the colour changed to greenish. 'We are approaching the river mouth', said Starry.

'Ok, we'll try to stay closer together. It's very difficult to overcome the powerful current', the group leader replied. 'Remember to swim near the river bottom and along the banks, where you can also find shelter and places to rest. Take care, and avoid fishing nets! Good luck!'

The group entered the river, and the battle against the current began. Their bodies were twisted by the strong flow, but soon they managed to reach the river bottom, where the current was slower, and they could swim.

A few hours later, Kyra was exhausted. Starry saw that she was slowing down and guided her to a large rock on the river bottom: 'Hide behind the rock. We can stay here until we recover our energy.'

'Thank you, I could not swim further. I'm very tired', Kyra answered.

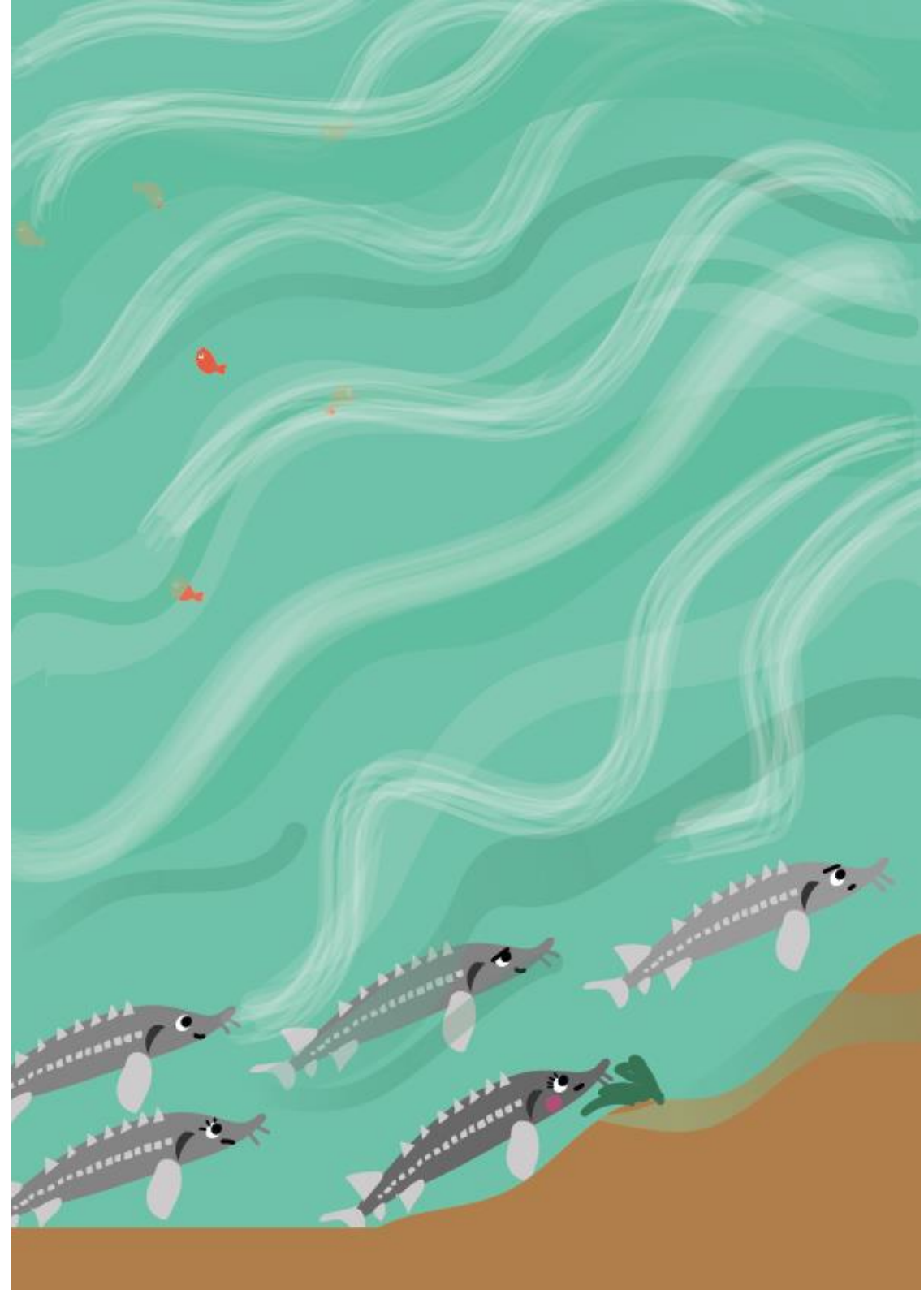
Four more sturgeons joined them, trying to catch their breath. 'It's getting darker outside. Soon we should find a place to rest for the night to avoid fishermen.'

'I think we're approaching the farm where I was born. I can recognize the water taste,' said Starry. 'We can look for shelter nearby.'

One hour later, they left the rock and started again to swim against the current. Suddenly, Starry spotted a familiar silhouette. 'Kenny, is that you?' Starry asked, surprised. 'We met years ago, when I was trying to find my family.'

'Starry? Wow, how big you are! Now you're larger than me, although I'm far older than you! Did you find your family? What are you doing here?' Kenny asked.

'Yes, we met in the sea. Now we're returning with other groups for reproduction. I'm going to be a dad, Kenny, can you imagine? This is my wife, Kyra. After swimming the whole day against the current, we are exhausted. Can you help us find a shelter for the night?'



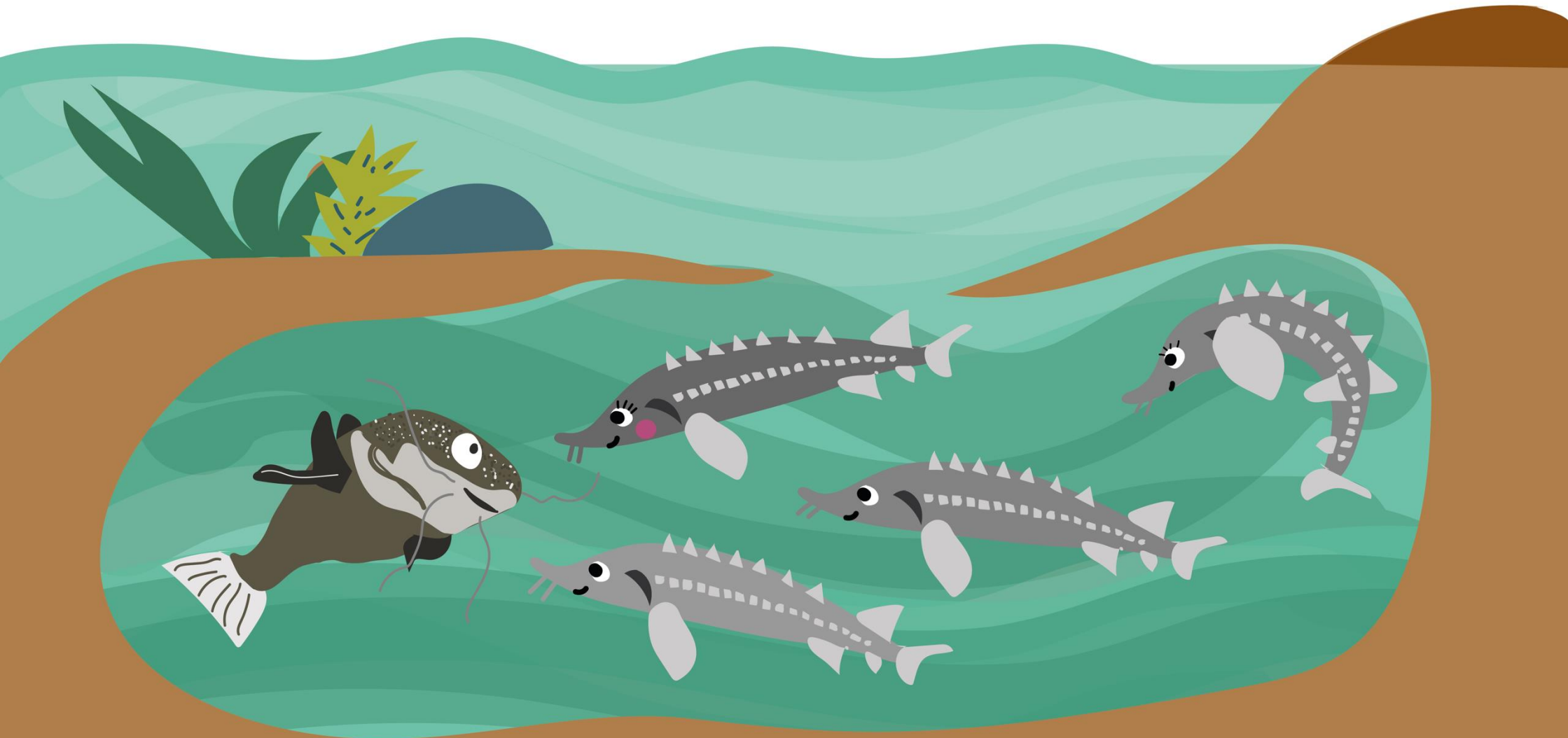
‘Of course! Please come with me, soon this place will be crowded and very dangerous.’

The group followed Kenny, and in a short time, they reached a wide hole on the river bottom where Kenny invited them. ‘Please do come in. I can also serve you some food, as, I guess, you are hungry and tired after a day of travel.’

‘Thank you, this is very kind of you,’ Kyra answered.

‘You mentioned that the place is dangerous. What is happening here?’

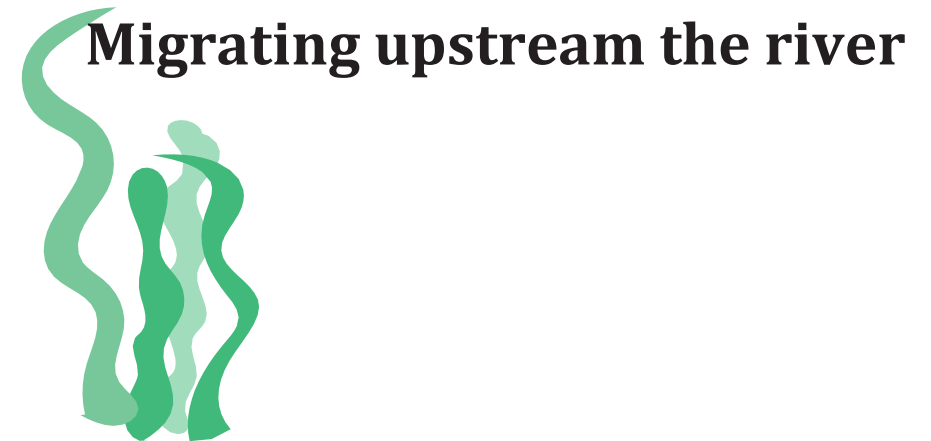
‘Oh, some nasty humans are coming, and although fishing is prohibited during the spawning period, they throw fishing nets and wait the whole night to see what they catch.’



In the morning they disappear, scared that the police may arrest them. This is how entire fish families were lost before spawning, and without new generations, there are fewer and fewer of us in the river.'

'This is terrible', said Starry, 'it means you're also at risk of disappearing like we are! They don't understand that without allowing you to reproduce, all the fish in the river will soon be lost?'

'Apparently not,' Kenny answered. 'Sadly, they don't realize that we play an important role in the river's health, that we also have the right to live, to have families, to be happy. For them, we are just food and entertainment. Whenever you hear noise from their motorboats, swim away! It means they are near and will harm you. Now, let's sleep for a while. Tomorrow you'll have a long journey ahead.'



The morning came, and the sturgeons started to prepare for the upstream travel. Before departure, Kenny gave them several additional instructions: 'The river channel is narrow, the water is fast running, and unfortunately, you don't have many places to hide from dangers you may encounter. You should take note of several things: first, noise means danger – either it comes from boats or from pumps and tubes that abstract water for various uses – this is dangerous especially for your new-borns as they can be pulled in immediately, so try to avoid noise as much as possible; second, if the water contains foam or has any other colour instead of green, again, swim away as fast as you can, as this means that the river was polluted and the water is toxic; third, if you see construction going on along the banks or in the river itself, the area may turn into a trap and it's difficult to escape - swim as fast as you can to natural stretches, where you can hide if needed.'

‘Well, thank you so much for your advice! Let’s hope for the best,’ Starry answered. ‘We’ll meet you in a few days, when swimming back to the sea!’

‘Bye! Have a safe trip!’

The sturgeon group left Kenny’s shelter and again started the fight with the strong river current, heading towards the upstream sectors. After a few hours, they spotted a large black patch on the river bottom and few fish coughing badly: ‘Hello, are you ok? What happened here?’ Starry asked, very worried.

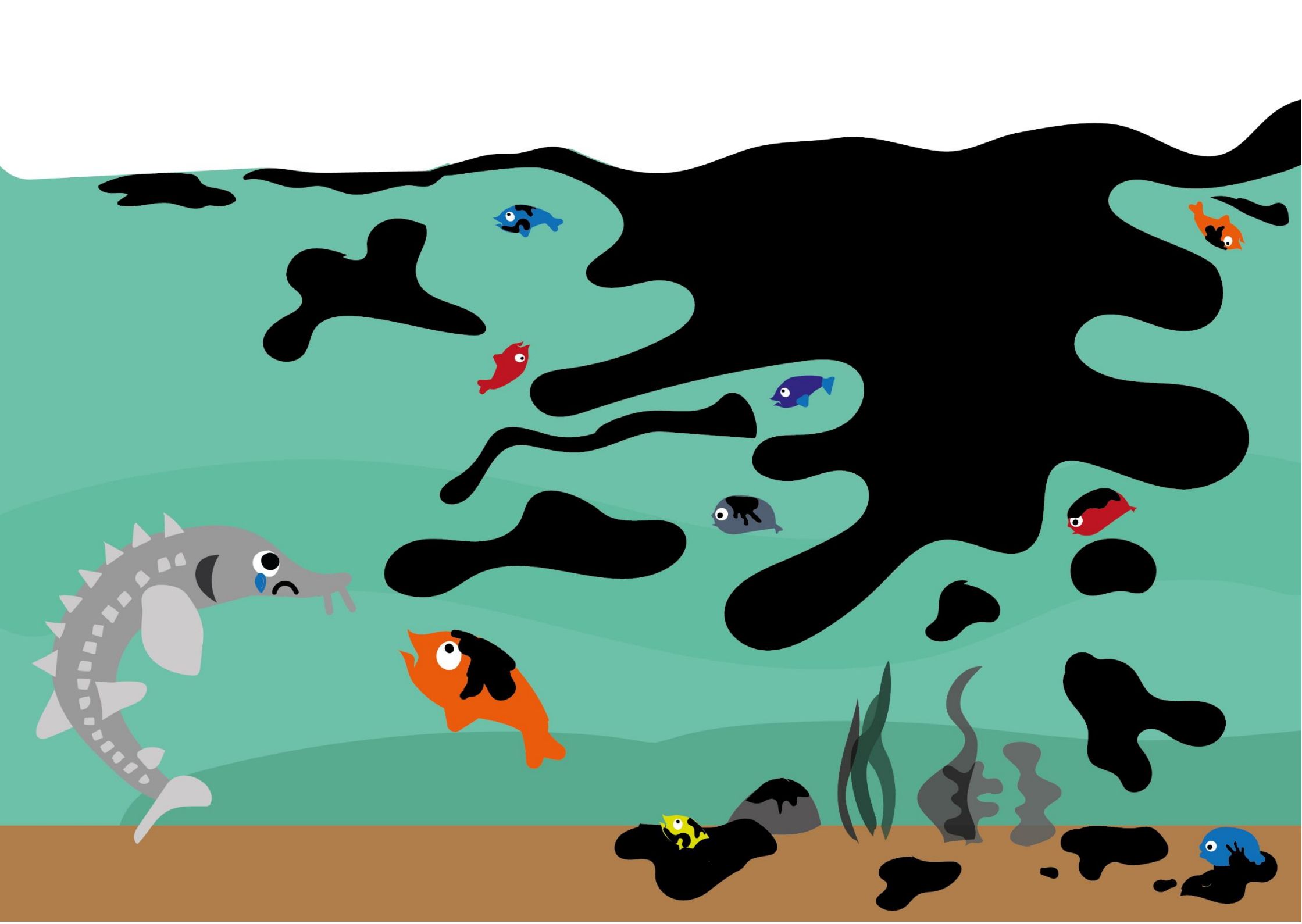
‘Hi. We hope to recover’, answered a little fish. ‘We’re near a port, where large shipping vessels have cleaned their engines, and their fuel flowed into the water. We can’t breathe anymore, not to mention that our home was covered by a layer of oil and we’ll have to move.’

‘Ooh! We’re really sorry! It would probably be better if you don’t stay here and move quickly before it gets even worse!’

‘It’s not so easy to move. The oil has spread over several kilometres. Besides, there are no natural river banks in the whole area. The river banks are covered by concrete structures, and you can’t find food or shelter for long distances. We’ll have to seek shelter on the territory of other families, which will create tensions and conflicts. If the humans would only have been more careful when cleaning their ships, we could have kept our homes and our normal lives. Now, we don’t know where to go.’

‘I still think it’s better to leave this place. Perhaps, in a few days, the oil will be washed away by the river, and you could come back to your home. Good luck!’ Starry turned around swimming away with Kyra.





A few kilometres upstream, they found the rest of the group hesitating to pass. The water was reddish, and the taste was very strange. On the river bottom, there were lots of dead organisms, and Kyra remembered Kenny's advice. 'Hmm, this is probably another polluted area. Granny mentioned once that they had to face pesticides on their journey, and the effect was terrible. Humans are using them on agricultural fields to control pests, without understanding that these products affect their health as well: they accumulate in the plants or vegetables they eat or reach the water, where they can kill aquatic organisms. The effects persist over long periods and also affect new generations. We should swim to the other bank, perhaps the situation is better, and we can move further upstream.'

The sturgeon group crossed the river and – indeed – the water taste turned gradually to normal. The group was swimming faster, trying to leave the poisonous place behind. After a few more hours of swimming, Starry heard a familiar voice: 'How are you, little brother?'

'Andy! I'm so happy to see you! How are you?'

'Tired. We've spent several days in the river trying to find the best places for spawning, and now we are heading home.'

The rest of Andy's group joined them. 'We should find a place to rest for the night, said an old sturgeon. We just passed a protected area. We can go there, and we can chat in the evening. Tomorrow morning we can resume our travels: you go upstream to reproduce, while we go downstream to the sea. Is this ok with all of you?'

'Yes', the other sturgeons answered.

Luckily, the protected area was nearby, and they found a deep pool in the riverbed to spend the night. Kyra was very tired. 'Are you ok?' Starry asked. 'I know it is more difficult for you to swim as you are carrying the eggs, so please, let me know whenever you want to take a break.'

'I'm ok, thank you,' Kyra answered. 'Let's go and chat with your brother. Perhaps he could recommend a good spot where I can lay my eggs.' They joined Andy's group of sturgeons to exchange news.

'Our elders have told us about great spawning sites located far upstream. We have tried to reach these spots, but many of them were destroyed recently: the river was channelized, dikes, and buildings were constructed along the banks, and a large dam completely blocked our passage further upstream – we could not pass! It is more and more difficult to find spawning areas and places where the young ones can feed before moving downstream to the sea.'

'Aah! The situation is even more critical than I thought,' said Starry. 'I hope people will soon understand that fish also have needs, and will help us by restoring some of our places!'

'But what can we do now, where can we find the few remaining places when they are disappearing so fast?' Kyra was exhausted and had tears in her eyes.

'There are two protected areas where a few suitable places are still available,' Andy replied. 'This is where we spawn, and our advice will be to look for new sites in the same area. You need to swim one more day, and you'll reach them. However, you should pay attention to invasive fish – they have started to colonize the

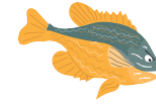
river and represent a serious threat for our babies!’

‘Thank you very much for your advice, Andy. This will spare us a lot of effort and energy,’ Starry replied.

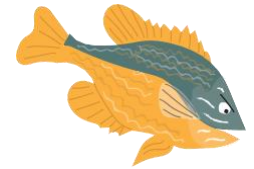
Both sturgeon groups spent the night trying to rest and save their energy for the following days. The next morning, the first group left early towards the sea, while Starry and his group had

a light breakfast and started to swim upstream, towards the protected areas. After half a day, Kyra was tired, and she slowed down, while Starry joined her, looking for a place to rest. They entered a completely deserted zone and wondered what happened there: no living creature, no movement, no sound. Where could they have all gone? Suddenly, a terrible pain passed through their bodies, their muscles were paralyzed, and they lost consciousness.





Kyra and Starry fight to save their children



The two sturgeons were carried downstream by the river. The cloudy water was hiding them from view, while the current was pushing them gently towards the bank. Soon, they got entangled in tree roots and remained there unconscious for a few hours. Gradually, Starry and Kyra started to recover and tried to understand what happened: 'I've never felt such a pain', said Kyra.

'What was this? How did we arrive here?' Starry asked.

'I guess, humans tried to electrocute you,' said a grave voice. An old crayfish was watching them behind the tree roots. 'You were lucky to escape alive.'

'Electrocute? What is this?' Starry asked, surprised.

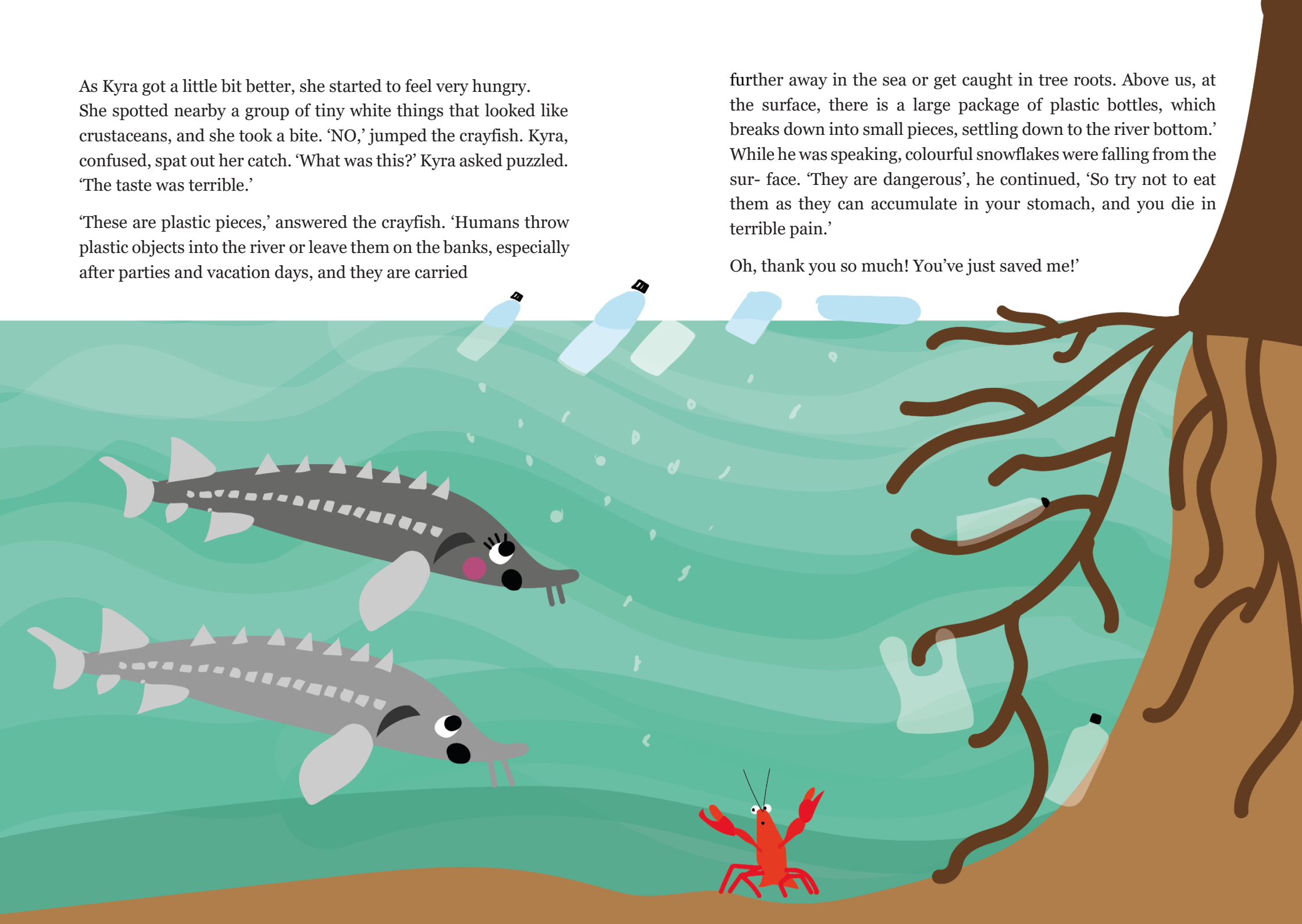
'It is illegal, but some humans use electric current to catch fish. If they use strong currents, large fish die, and they collect them. In time, this has severe consequences, as the river becomes depleted of all life.'

As Kyra got a little bit better, she started to feel very hungry. She spotted nearby a group of tiny white things that looked like crustaceans, and she took a bite. 'NO,' jumped the crayfish. Kyra, confused, spat out her catch. 'What was this?' Kyra asked puzzled. 'The taste was terrible.'

'These are plastic pieces,' answered the crayfish. 'Humans throw plastic objects into the river or leave them on the banks, especially after parties and vacation days, and they are carried

further away in the sea or get caught in tree roots. Above us, at the surface, there is a large package of plastic bottles, which breaks down into small pieces, settling down to the river bottom.' While he was speaking, colourful snowflakes were falling from the surface. 'They are dangerous', he continued, 'So try not to eat them as they can accumulate in your stomach, and you die in terrible pain.'

Oh, thank you so much! You've just saved me!



The crayfish advised them where to find a place to rest for the night, and in about ten minutes, they were in deeper water, hiding behind large rocks, near the riverbank. 'I am so happy that we found a safe place to rest. My whole body hurts, and I cannot feel my fins anymore,' said Kyra before she fell asleep.

The next morning they were feeling a bit better, but Kyra was afraid to leave the shelter. 'What happens if we meet those people again? I am afraid I may not survive a second electroshock or that my eggs will be affected. We should try to find a spawning ground as soon as possible.'

'I agree with you, it was terrible, we were lucky to escape alive, and that might not happen again. This place seems quite clean, with deep water, like we need. Can you stay here for a short time, while I look for possible places nearby?'

Starry disappeared, swimming upstream, and soon he returned with good news: 'I think I found a perfect site. Would you like to check it as well? We can reach it in five minutes.'

'Great!' Kyra started to swim, and soon they reached the place. She agreed that indeed, this was the perfect site for their nest, so she began to prepare for laying the eggs. One hour later, both sturgeons were happy: mission accomplished, her eggs were safely deposited and fertilized.

'Do you think it is safe to leave them here alone?' Kyra was very worried. 'Perhaps it is better to guard them for a while, to see if there are dangers around.'

'Good thinking,' Starry answered. 'You can go and rest in the shelter, I will remain here, and come back later; after this, you can watch them, ok?'

'Safe watch', said Kyra, swimming towards their shelter.

A few hours later, Starry came to rest. 'It was ok, he said. I only saw some mussels and small invertebrates, but they didn't come near our eggs.'

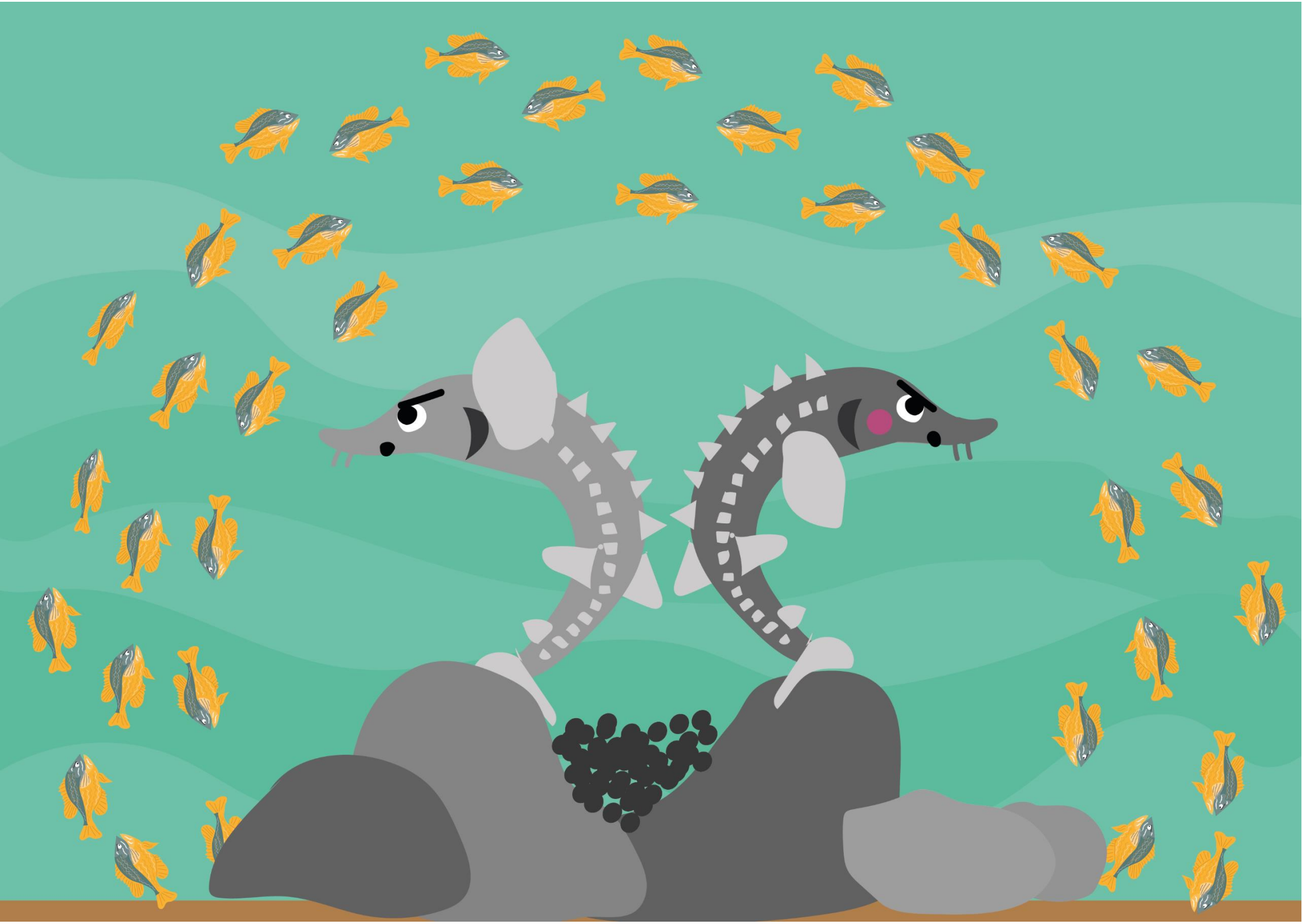
'Ok, it is my turn now, try to rest a bit,' said Kyra. 'I hope we'll be ok.'

Starry had nearly fallen asleep when he heard Kyra shouting for help. In two minutes, he was there, just in time to see her fighting with some small, very colourful fish, trying to eat on their eggs. They were so greedy and aggressive! Poor Kyra was surrounded, and she couldn't defend all the eggs, so Starry got really angry seeing that they were ready to reach them: 'Hey, what are you doing there?' he shouted, while swimming next to Kyra.

But the small fish were not willing to start a discussion. They had only one thing on their minds: to eat the eggs! Suddenly, Starry remembered Granny's words – 'Sturgeons are the largest fish in the river, so you should fear no one except humans!' He attacked the group of enemy fish and started to swallow them. Surprised by the attack, they left the eggs and tried to fight with Starry, but then Kyra came along with him and together they managed to push the group away. Soon, only a few enemies were left, and they were swimming away to save their lives.

'Wow, great teamwork', said Kyra. 'We managed to save the eggs. I didn't know that you can be so aggressive!'

'Neither did I', Starry answered, 'but so far no one has tried to harm us or our eggs. You know I'll do everything to protect you and the kids!'



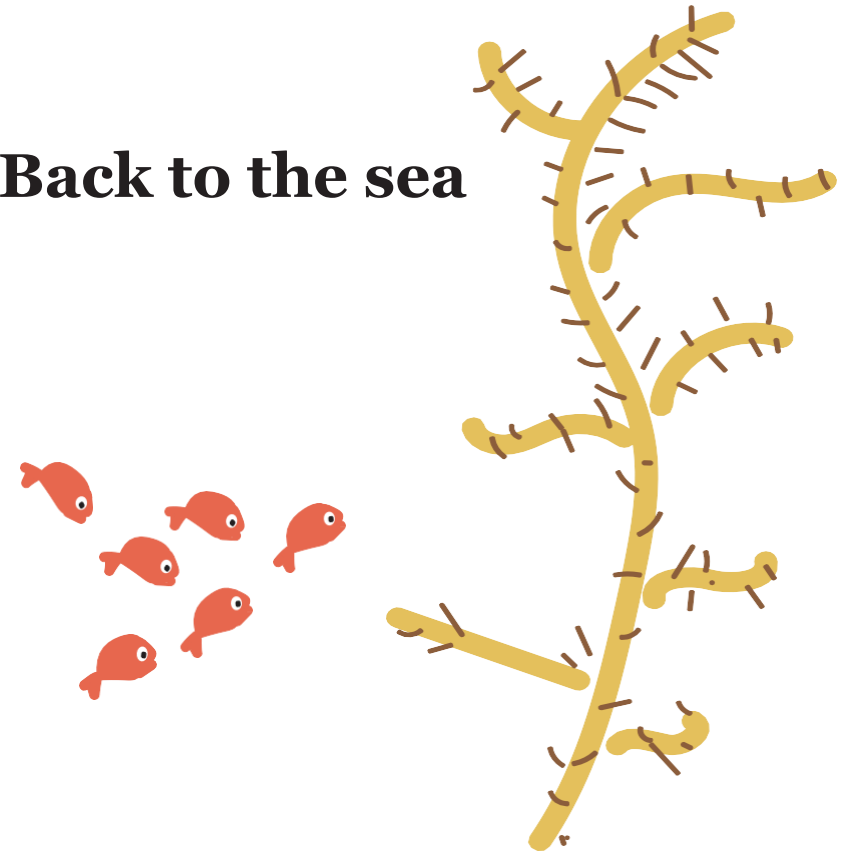
‘What was that?’ Kyra asked, worried. ‘They seemed to be normal fish. I tried to explain that we are an endangered species and that it’s very important that our kids grow up safely, but they didn’t seem to understand.’

‘If you can stay here to watch the eggs, I will try to find our crayfish friend and ask him, perhaps he knows something about these strange fish,’ said Starry. Soon, he returned with news. ‘Again, we were very lucky! The crayfish thinks we met the Pumpkinseed sunfish, an invasive species responsible for destroying many fish populations in the river, as they prey on their eggs.’

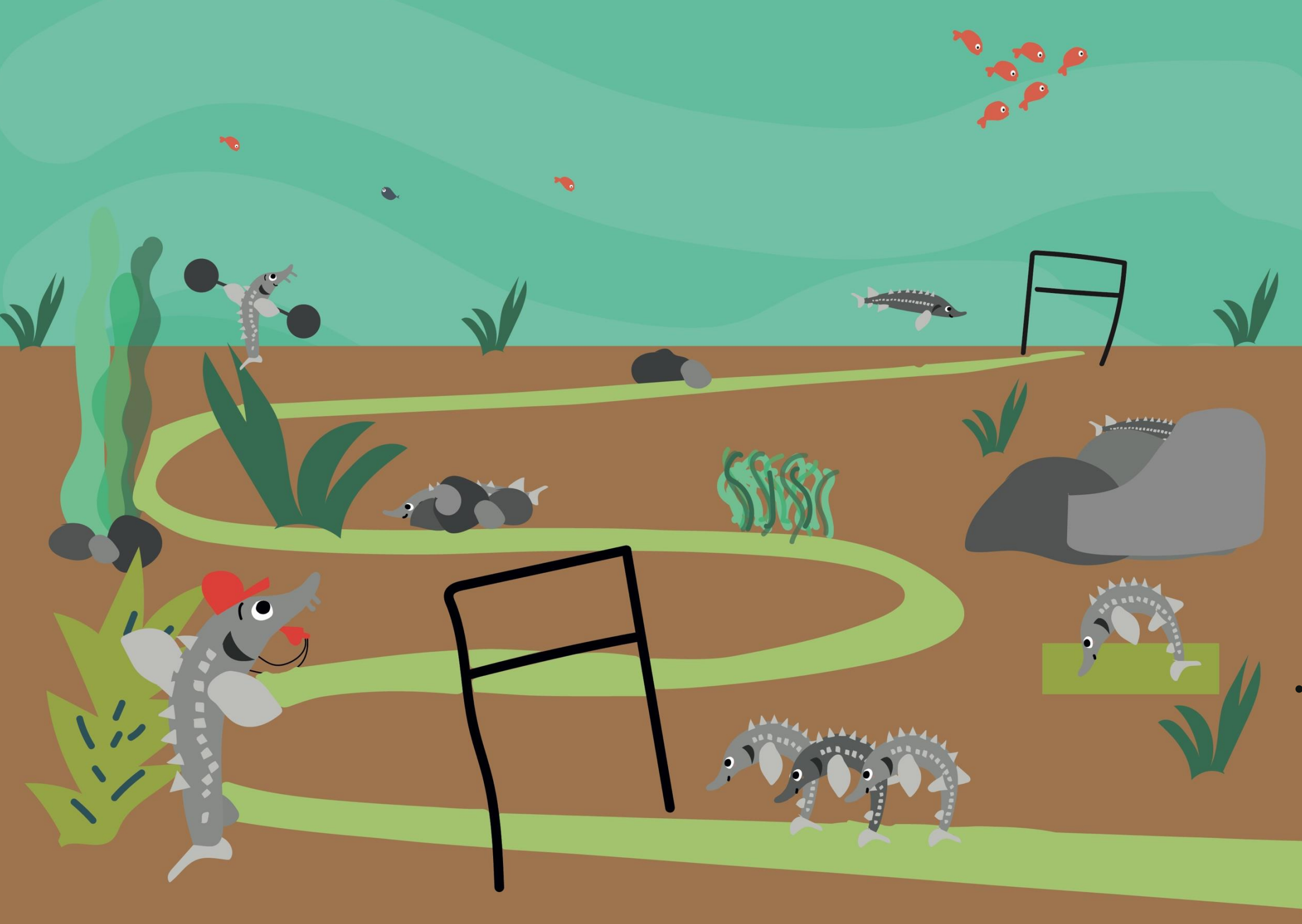
‘Well, probably these were the fish mentioned by your brother’, said Kyra. ‘Great that we managed to defeat them. Can you imagine what would have happened if we would have left the eggs unguarded?’

‘I don’t want to imagine any bad thing anymore, we had plenty along the way. We’ll watch them until the kids are born, and we’ll return together to the sea to guide and protect them.’

Back to the sea



A few days later, the young fish started to hatch from the eggs. Their parents were very happy: the little ones were so cute! Once all the eggs turned to young fish, Kyra and Starry started to train them what to eat, how to swim in the current, and how to hide and stay away from dangers.



Another month passed without major incidents. One day, a small group of sturgeon babies passed near their temporary home, and Kyra and Starry understood that it's time to migrate back to the sea. Starry went to say goodbye to the old crayfish, and they started to prepare the kids for the big journey.

'During the next days, we'll swim downstream to the sea. We'll try to stay together, but as I experienced, this is easier said than done. The current is very strong, and you'll be carried downstream without many options to change direction. During our way, we'll pass some areas where we need to hide from humans to avoid fishing nets, or to avoid pollution or the areas of ongoing construction. For this reason, I'll lead the way, while Mammy will stay at the back of the group, making sure that you are not lost on the way. Understood?'

'Yes, Daddy, we'll follow you.'

'What happens if we're lost?' one little girl asked.

'In this case, you swim faster and try to stay hidden in the water. The river will do the rest and will carry you to the sea. You'll feel the passage to the sea when the river taste will change to saltier. At that moment, you'll swim along the seacoast, and we'll meet there, ok?'

'Ok, we are ready to go!'

The whole group left the area, swimming downstream hidden by the cloudy water of the river. Knowing where they faced troubles along their way upstream, Starry sometimes changed direction, and the kids followed his movements. It was incomparably easier to swim with the current. They're advancing pretty fast, and at

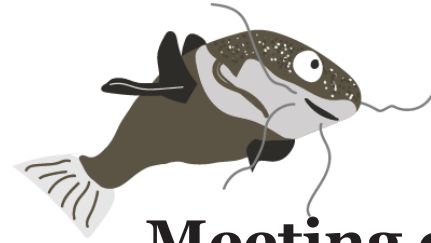
one point, Starry recognized the familiar water taste – they're already near the farm where he was born!

'Hello! Make room! We're coming!' Starry heard a little voice near him and a few young sturgeons bumped into his body.

'Hello' said Starry surprised.

'Sorry, we still have problems in adapting our swimming techniques to the strong current. Hope we did not hurt you', the little sturgeon continued. 'We are going to the sea. And you?' another young sturgeon added.

Suddenly, Starry understood that the newcomers were a group of young sturgeons just released from the farm and he smiled: 'We're going to the sea as well. Would you like to join us?' The whole group was now much larger, and Starry realized that they could easily be spotted by humans. They definitely needed to change the strategy to survive.



Meeting old friends

Starry started to look for a place to discuss a new strategy, and soon he found the shelter of his old friend Kenny. Even more, his friend was at home, happy to greet them: ‘Hey, you returned,’ said Kenny. ‘Wow, you have plenty of kids!’ he added, puzzled by the high number of sturgeons.

‘Hi, Kenny, good to see you again,’ Starry answered. ‘Only some of them are our kids, the rest come from the farm where I was born years ago when you helped me. I’m guiding them to the sea, and we’d like to rest for a while near your place if this is ok with you. We want to prepare our strategy to avoid humans and other dangers.’

‘All sturgeons, attention please,’ said Starry. ‘We’ll split into two groups, I’ll lead the first one, the second will be led by Kyra. This way, we have better chances to pass undetected by humans.’

‘A word of caution before you leave,’ Kenny added. ‘At the river mouth, fishermen are now fishing for shads, who are coming in the river to spawn, like you did a few weeks earlier, Unlike you, they swim higher in the water, therefore, the nets are deployed near the surface. To avoid being trapped, please dive near the river bottom, and you’ll escape to the sea.’

‘We have just a few hours of swimming, and we’ll reach the sea. Once there, we’ll quickly rest and feed, and then we’ll head to the marine sanctuary!’ said Starry.

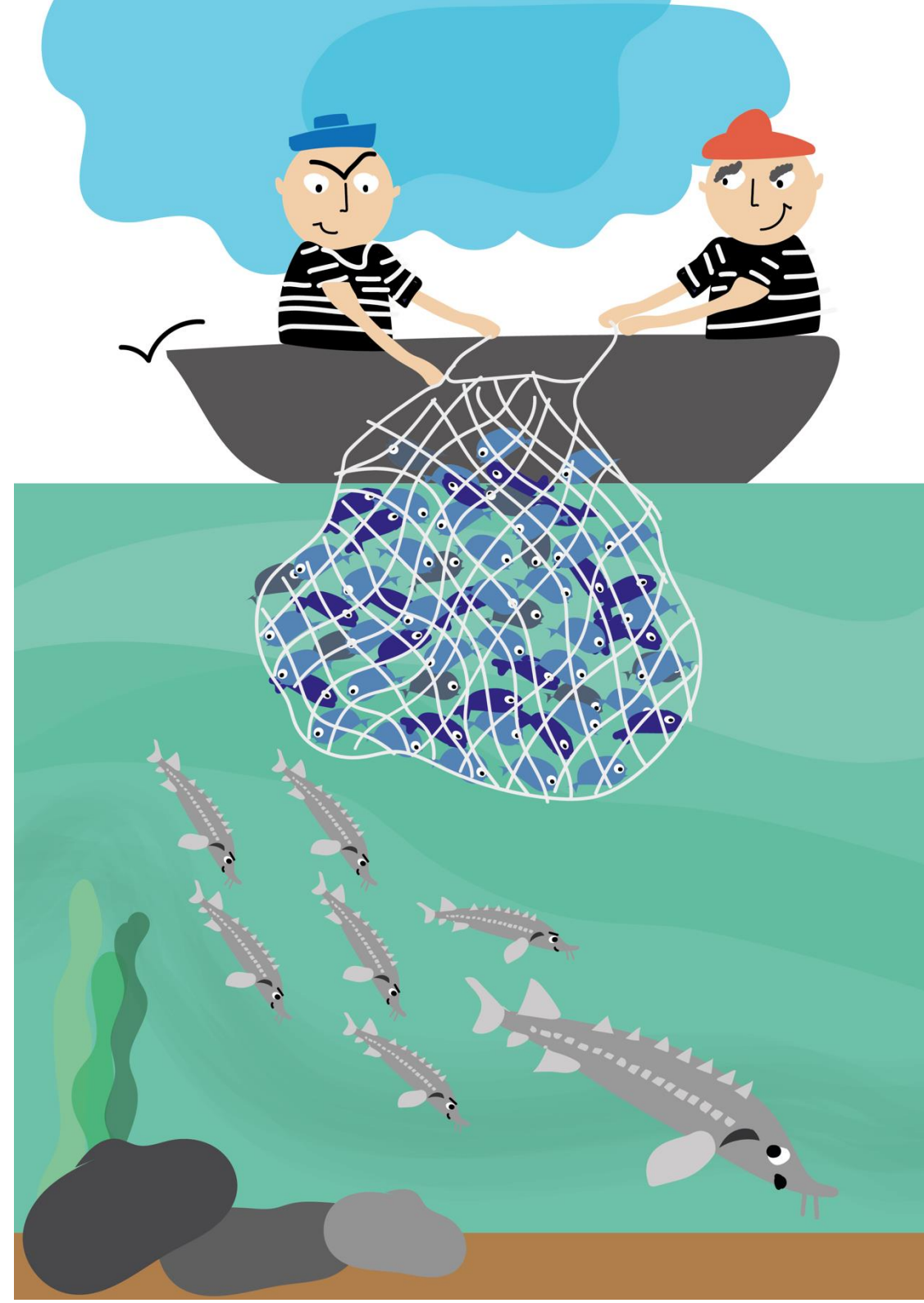
‘Let’s go’, the little sturgeons replied.

The group split into two parts, and the little fish followed Starry and Kyra. After swimming for a few hours, Starry felt that the water was changing, and he realized that they were approaching the sea. Knowing that fishermen should be near, he started to dive, followed almost instantly by the whole group, right in time to avoid the nets above. Several shads were already caught in the fishing net, and Starry’s heart was very sad, knowing that they will die without having the chance to migrate and reproduce! If people could only understand how important it is to allow fish to reproduce and create new generations! They could have at least captured the adult shads on the way back to the sea, after reproduction, while the young generations could ensure the species’ survival.

He entered the sea with his group and turned to the coast, waiting for Kyra at the feeding ground, where they had met for the first time. Half an hour later, she arrived with her group, having tears in her eyes.

‘Oh, it was terrible,’ she said. ‘I saw you diving, and I feared that you would be caught in the nets. I also saw the fishermen pulling out the nets with the shads, but it was impossible to save them.’

‘I saw them as well,’ said Starry. ‘It’s really sad, but we cannot change this, unfortunately. Please try to see the bright side: we managed to bring home our kids and the group from the farm. This will help our species a lot, as more sturgeons will become



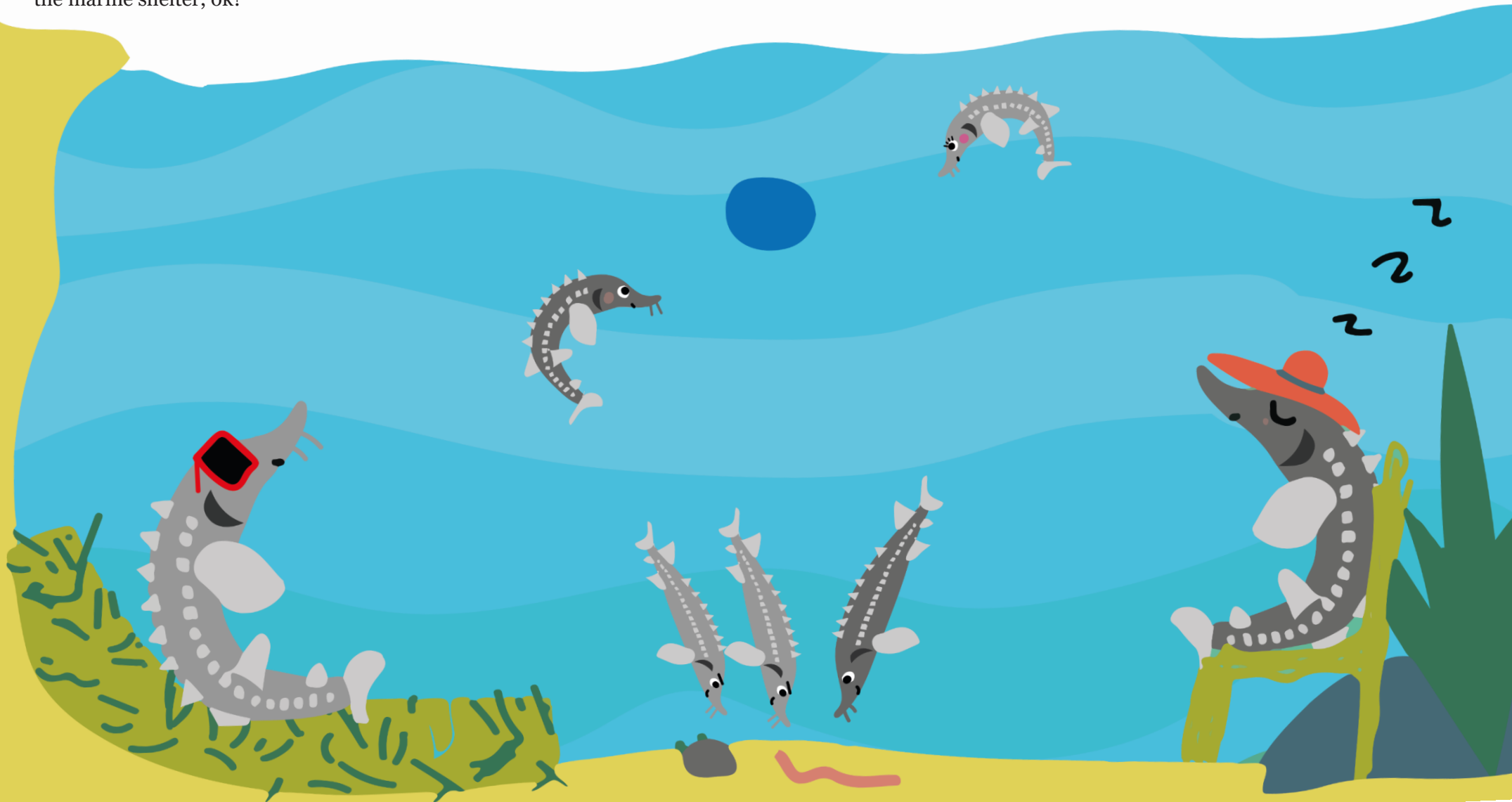
mature and will participate in further migrations. Perhaps people will gradually understand that shads also need protection, especially during their reproduction, and they'll also have a rescue program.'

'Let's hope the future will be brighter for all fish species.'

'Kids, we'll rest here for one hour, and then we leave for the marine shelter, ok?'

'Ok, dad.'

The little sturgeons were happy to play and feed near the sea-coast, in the warm, shallow water. For the first time in their journey, Starry and Kyra could relax a bit, knowing that in a short time the whole group will be safe. The break ended soon, and Starry announced the departure. 'Are you ready to reach our new home? Let's go!'



Epilogue

The years passed, and the little sturgeons grew up peacefully in the marine sanctuary. Starry became a legend among the sturgeon families as he succeeded in protecting and bringing home his young family and the 'farm group' of sturgeons safely. Thanks to his wisdom and courage, he got the nickname 'the brave sturgeon', and more and more sturgeons came to him for advice, to find out where the dangers were located and how to avoid them. The sturgeon families gradually grew, more young sturgeons swam in the sea, and happiness was reigning in the marine sanctuary.

One day, Starry gathered his children to prepare them for the spawning migration. 'You know that in a few days you'll meet with other sturgeon groups, and you'll have the journey of your lives', said Starry.

'Yes, Daddy, we've already discussed the details with Granny,' Cam, one of his girls answered. 'We even met with our cousins, and uncle Andy is sending you best greetings!'

'Great, I'm happy that you're well prepared. However, before leaving, your mother and I would like to tell you a final story – where and how you were born, and how you reached the sea. It

could help you to know that we have friends in the river, but also enemies, and that you'll face severe dangers, so you should be very careful.'

'Hey, this is interesting. We haven't heard all the details yet. Can we also ask our friends to come? It could be helpful for them as well,' Cam asked.

'The more, the better,' Starry answered.

One hour later, hundreds of stellate sturgeons were present to hear the story. 'Wow, I didn't know that you have so many friends,' said Starry.

'I don't know all of them, but you do', Cam answered. 'They're part of the group of sturgeons born at the farm, that you guided here years ago. We'll all listen to your story, and hope we'll be brave like you and Mammy, and bring our little ones home safely. But before telling us the story, let me introduce you to my partner, Alan. He was born at the farm as you, dad, you helped him to reach this site, and we hope to form a family for the rest of our lives! This was possible, thanks to you, dad!'

'I'm very happy for you! Hope you and Alan will have a safe spawning trip, and you'll form a strong and happy couple, like Mammy and me!'

'Thanks, Daddy! Love you!'



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Although sturgeons have existed on Earth for 250 million years, surviving the tough environmental conditions that triggered dinosaurs' disappearance, humans have managed to bring them to the brink of extinction in some 100 years. The main causes of decline are habitat loss, disruption of spawning migration, and excessive fishing for caviar. Most sturgeon species live in the seas of the northern hemisphere and migrate in rivers for spawning. They are the largest fish in freshwaters; they mature late and can live for decades. All these traits and their complex life cycle make them very vulnerable, many individuals being captured before having the chance to reproduce. Nowadays, the wild populations are in a very poor state, and most sturgeon species are critically endangered.

More information about sturgeons can be found at:

<https://dstf.info/about/>

<https://www.wscs.info/>

https://www.danube-iad.eu/index.php?item=fishery_fish_biology

<https://www.icpdr.org/main/activities-projects/sturgeons-danube-basin>

https://www.panda.org/knowledge_hub/endangered_species/sturgeon/

This children's booklet aims to increase understanding of the numerous challenges faced by sturgeon species throughout their lives and raise your support to save these magnificent "living dinosaurs".

Protecting rivers and keeping them in their natural state is beneficial both for the aquatic organisms and for human society, which gains access to attractive recreation areas, clean water, and healthy fish.

**By helping sturgeons and other
endangered species
YOU can be
NATURE's HERO, too!**



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