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AUD216 Project 1_Example

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AUD216 Project 1:

Sound Design and Native Implementation

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Documentation of research

In this section, outline the research conducted (min 700-words, max 1200-words)

It is important to differentiate between diegetic and non-diegetic sounds and implement these sounds appropriately (i.e. whether the sounds should be 2D or 3D). Diegetic sounds refer to sounds that are "a part of the game world" and can be heard by characters in the game, whereas non-diegetic sounds refer to sounds that don't exist within the game world, but can be heard by the player, such as UI sounds, musical score, or narration (Zizza, K., 2023).

Simulating the Doppler Effect (sounds appearing higher pitched as they move towards the listener and lower pitched when moving away from the listener) in a game environment can be crucial for creating a sense of realism with fast-moving objects (Zizza, K., 2023).

Having interactive music that adapts depending on what is occurring in the game can help to keep the player immersed and create more tension or excitement where needed. For start or setup menus, a looping track of music can be used. Brief "stingers" (i.e. orchestral flourishes or sound effects) can be used to emphasise certain key moments in a game like plot reveals or item pickups.

"Sourcing refers to the process of retrieving the necessary components of a sound effect for use in a game. There are many ways to source sound effects, making this an interesting task. Sounds can be sourced through licensing, designing synthetic sounds from scratch (synthesis), or through custom recording" (Zdanowicz, G., & Bambrick, S., 2019)

An integral part of implementing audio for video games is "audio asset management". This essentially refers to the way audio files are named and sorted before being implemented into a game engine. It's important to maintain an organized audio asset list that includes item names, file names, descriptions, and statuses to track the audio throughout production (Zizza, K., 2023).

A major consideration for audio in video games is proper implementation. This refers to how the sounds are placed and utilised in the gameworld, and how the player interacts with them. Proper implementation ensures that sounds play at the right time and place, with correct levels and processing. This includes managing assets, using triggers, and considering the impact of sound on gameplay. When implemented properly, audio should help to elevate the enjoyment and immersion of the game to the customers, not distract them or pull them out of the world (Sinclair, J.-L., 2020).

Another important consideration is environmental modelling. This means creating a believable audio environment in which the sound fits with the visuals presented to the player. This includes understanding the game's geometry and how sound propagates within it, as

well as using technology to approximate acoustics rather than simulating exact properties (Sinclair, J.-L., 2020).

A useful technique that might help with managing my level is "spatial partitioning". This refers to the practice of dividing the game space into a grid or other structures can help manage which audio sources are relevant based on the player's location, reducing the need for distance calculations for every source. This can be really useful for larger levels/game worlds as it means you can set up the engine to only play sounds while the player exists in a specific grid/partition, saving valuable processing power for more intensive things like graphics (Somberg, G. (Ed.)., 2023).
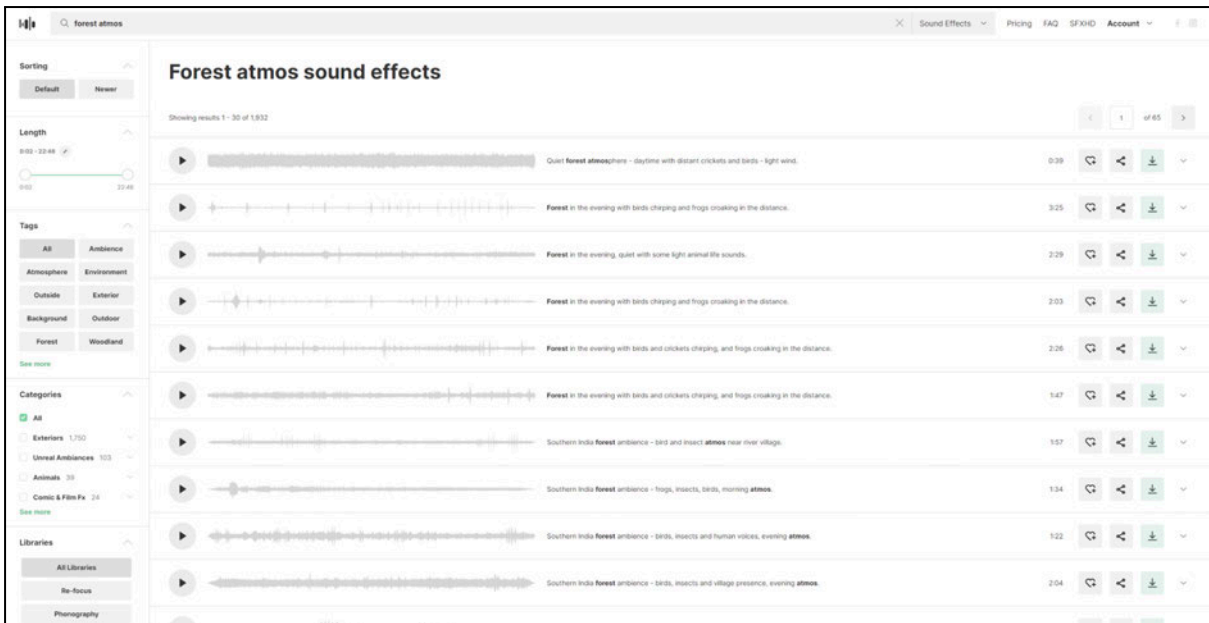
When implementing audio into a game environment, it's important to consider the use of static audio sources. Static audio sources refer to sound elements that remain fixed in the game world. Unlike dynamic sources (such as moving characters or vehicles), static sources do not change their position during gameplay. Some ways of optimising static audio sources in a game include optomising your resource management. Efficiently loading and unloading static audio assets based on the player's proximity. Unloading sounds that are far away or out of view. Another way is through streaming. For large open-world games, streaming audio data from disk to memory as needed can be useful as it can minmise memory usage and increase performance. Another way is through loops and transitions, ensuring seamless looping for background music and crossfading between different tracks during transitions (e.g., moving from a calm forest to an intense battle). The use of layering can also be quite effective. Layering multiple static sounds (e.g., wind, distant waterfall, and bird calls) can help build a rich immersive soundscape (Somberg, G. (Ed.)., 2023).

Audio production and implementation

Phase 1: Planning and Sourcing

General Atmos	Heavy forest	Waterfall	Light forest/cherry blossoms	Terrain footsteps	Cave	Snowy area	Open plains	Off map	Campfire	Pickups/magical sounds	Swamp	Pond areas	Music
Stereo forest atmos (i.e. wind, trees rustling)	Bird chirps	Water crashing on rocks	Bird chirps	Grass footsteps	Large cave reverb	Heavier wind	Wind atmos	Scream	Fire crackle	Magical hum/twinkle when approaching the chest	Frog croaks	Crickets	Main theme, mysterious but light
Occasional wolf howl in the distance	Wind in trees	River running sound		Dirt footsteps	Small cave reverb			Wind rush	Birds	Metallic clink combined with hollow bones and cabasa	Crickets		Darker theme when entering the swamp
	Leaves rustling			Water wading						Musical flourish and chest open sound when opening chest	Bubbling		
	Branches creaking			Snow footsteps							Flies		
				Wooden bridge footsteps									
				Stone footsteps									
				Bush rustling from walking through grass/scrubs									
				Bones scatter and crunch									

- FinaThis can be thought of as the "concept" stage. 'The Concept stage is where the developer is essentially deciding what type of game they will develop. Concept art and/or a prototype will be developed to further share the idea with others.' (Zdanowicz, G., & Bambrick, S., 2020).
- I started with exploring the level and brainstorming all the possible opportunities for sound implementation, and breaking them up into categories so I could stay focused on one area at a time.
- I went back and highlighted the cells green later on based on what I actually ended up implementing in the level.

- Once I had laid out all the sounds I needed to source, I began searching through Soundsnap and the Youtube Studio audio library (which is surprisingly really good and free).
- I ended up sourcing most of my foley and atmos from Soundsnap, while sourcing the music from Youtube Studio.
- There were some sounds (mostly human noises/dialogue) that I had determined I would need to record myself.
- I also determined that I'd need to edit a fair few of my sourced sounds to make them work.
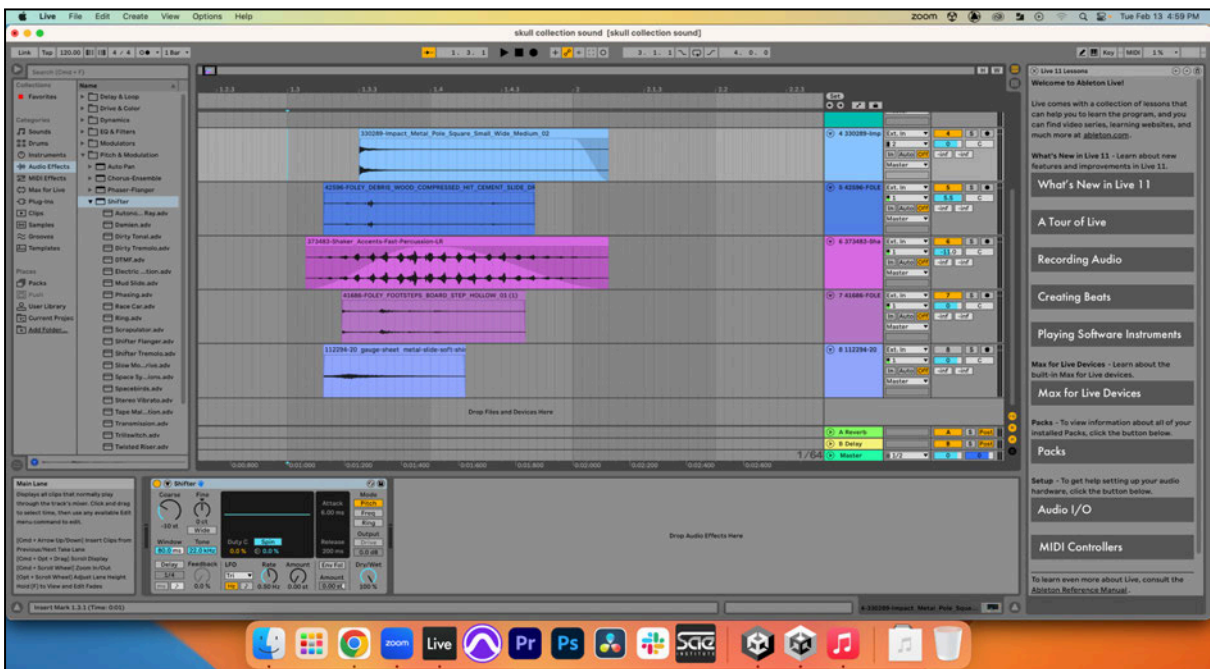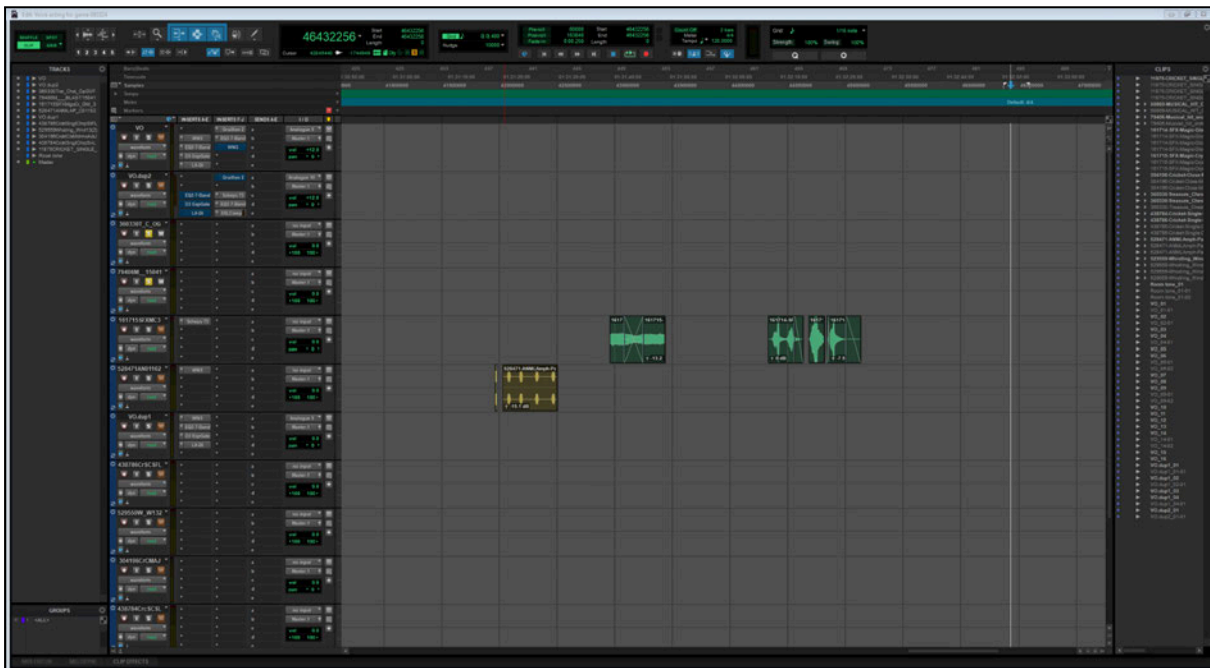
- For a few of the sounds in my level, I had to blend together a combination of sounds I had sourced from Soundsnap in order to achieve what I was looking for. Namely the pickup sounds for the skulls, in which I blended together in Ableton a pitch shifted metal clink, a wooden hit, and a shaker/cabasa rattle.
- I also blended together the sound of a chest opening with a musical stab for when the player collects the chest pickup.

- Most of the other editing of sounds I did included just cutting down longer audio files, and fading them in and out in order to sound more natural. I did also apply some light EQ/filtering to some of the sounds, but mostly left unprocessed.
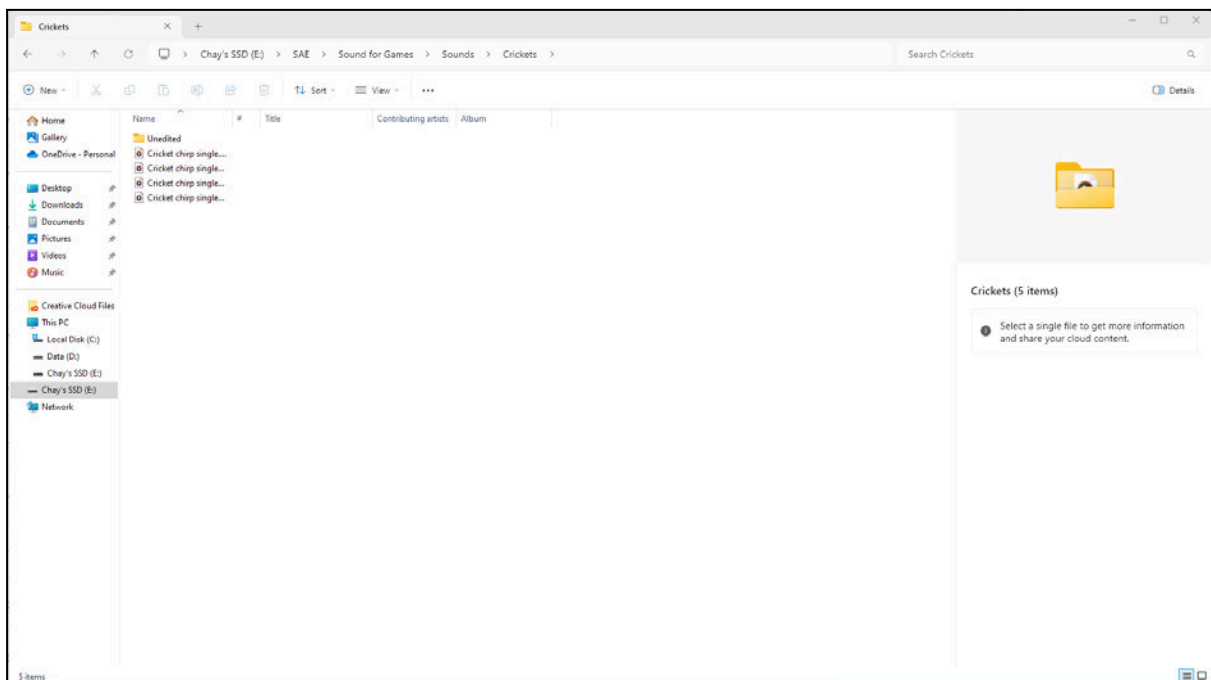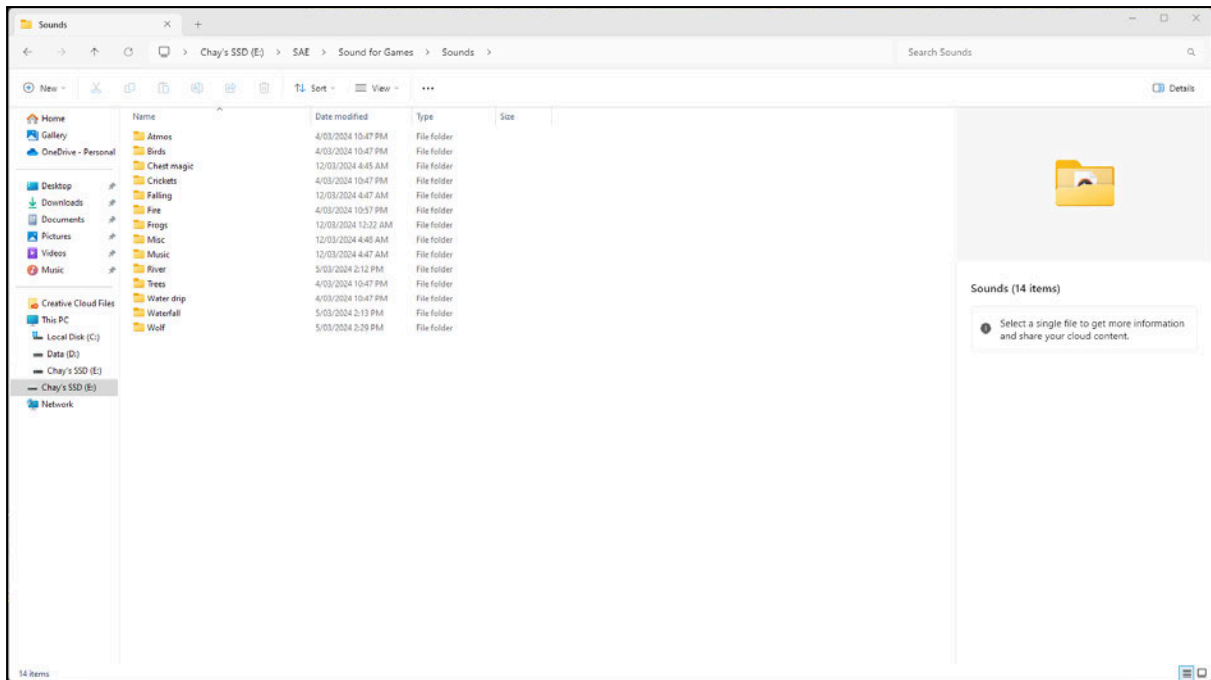
- Once all my editing of sounds was done, I compiled everything onto my hard drive, and organised my sounds into folders based on their category.
- For the sounds I had edited, I kept the raw unprocessed files too, but just separated them into "Unedited" folders, as I wouldn't need to use them.

Phase 3: Implementation
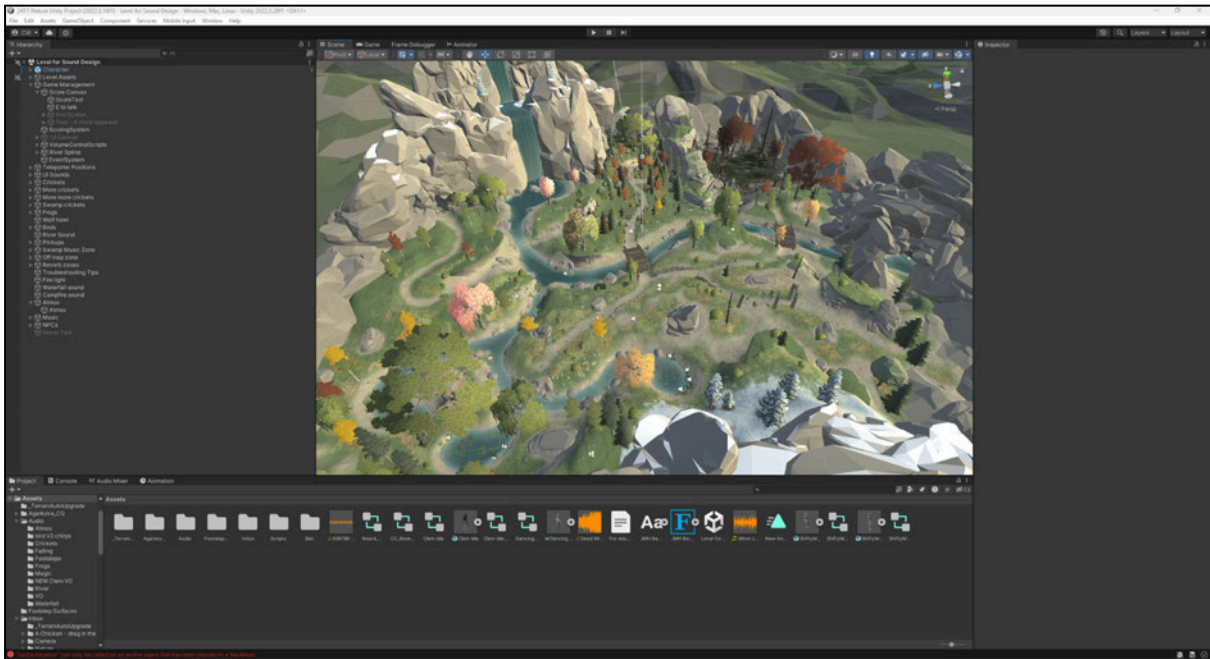
- Now that I had all my sounds in place and ready to go, I began implementing them into the level.
- I sadly didn't manage to implement everything in my planning spreadsheet (as seen earlier), but I may still add some more stuff this week before submission.
- Now I'm gonna run through everything I implemented and how I did it.
- I initially implemented some subtle forest atmos as a 2D audio source to the level, just as a base to build off of with the other sounds.
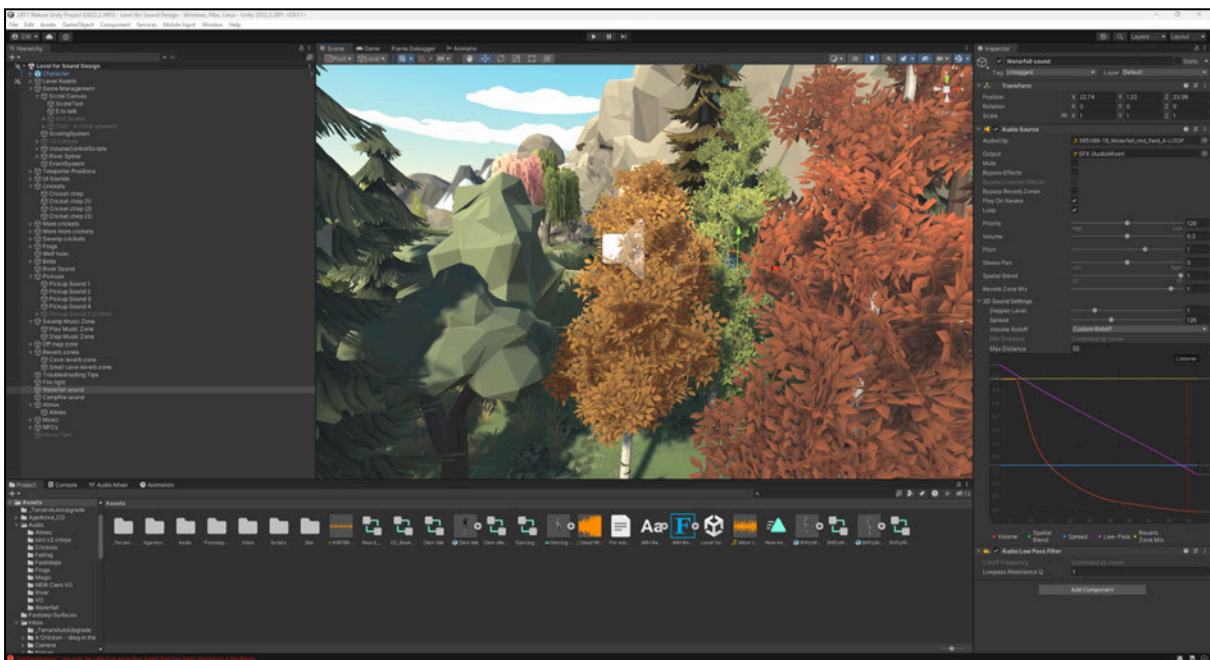
Bird Sounds

- I implemented bird sounds using the PlayRandomSound script provided (thanks Nick).
- I mostly just loaded in my bird sounds and tweaked the parameters a bit before placing a handful of these audio sources in trees throughout the level.
- I also added a subtle reverb to the bird mix bus I had created (which was a child of the SFX bus) in order to make them fit in the space better and feel more natural.
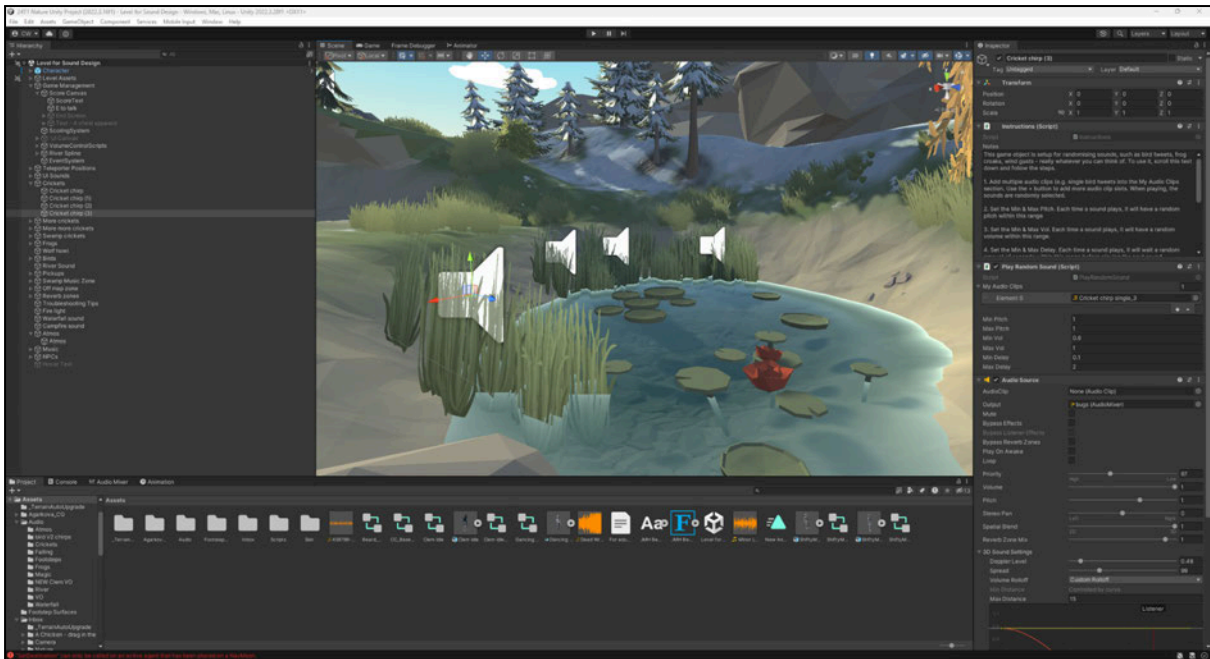
Crickets and Frogs

- I used the same script to also implement crickets into the pond areas, as well as frogs into the swamp.
- Only thing I really changed from the birds was keeping the pitch the same rather than having it vary, and making the chirps more frequent than the birds.
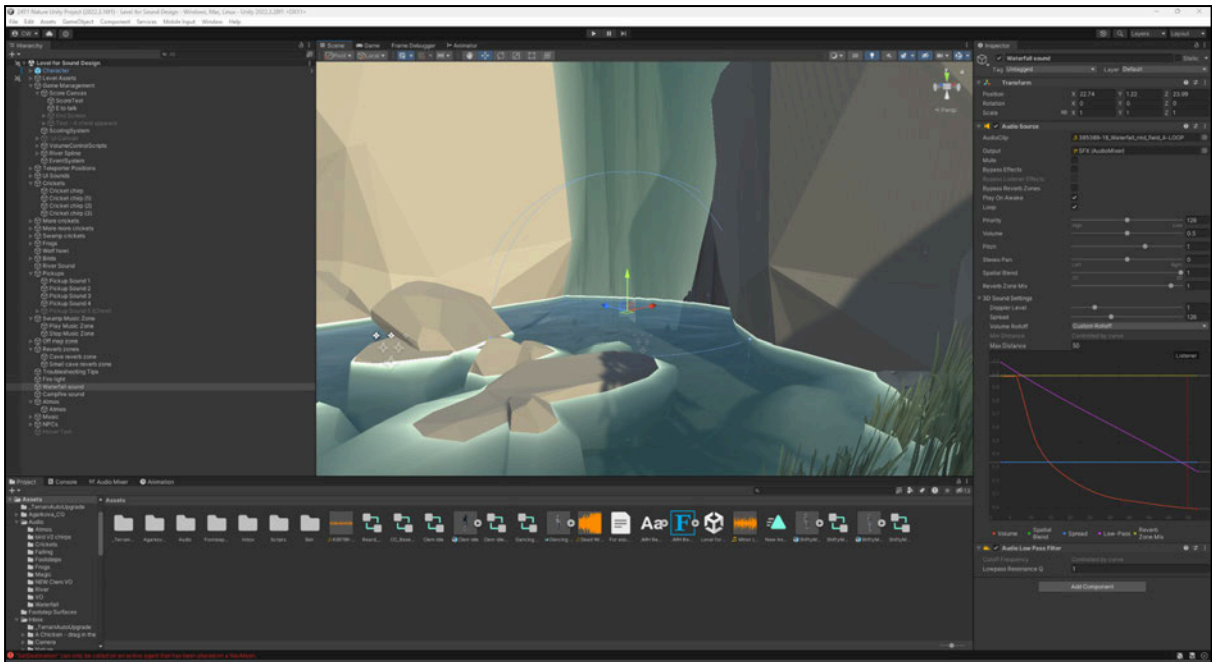
Waterfall and River

- I wasn't able to get the occluder working for the waterfall because of some error with the script, but I instead just tweaked the volume curve and added a low pass filter that rolled off high end of the sound the further the player was from the source. Maybe not perfect, but worked quite well.
- The river sound was pretty much drag and drop my water sound into the script provided. I did also adjust the spread though in order to make it sound more natural (thanks Dimi).
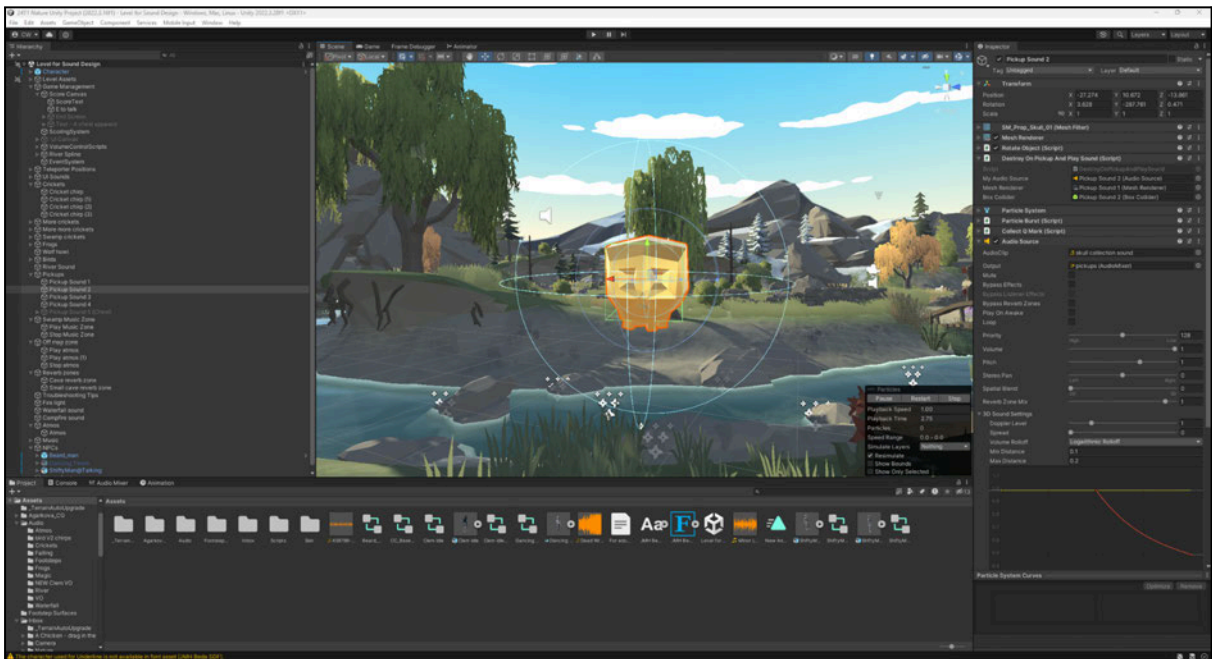
Pickups

- The pickup sounds for the skulls was also quite simple, just drag and drop. Because I had already edited and blended the sound earlier, there wasn't as much to do.
- For the chest pickup sounds though, I essentially added a 2D magical stab source as a child to the chest object, which meant it wouldn't play the sound until the chest was activated (after the last skull is collected). I also created a 3D audio source of a magical droning sound where the chest was located, so once the chest appeared, the player would hear the drone get louder as they approached the chest.
- Then I also added the chest pickup sound that I had put together to the chest.
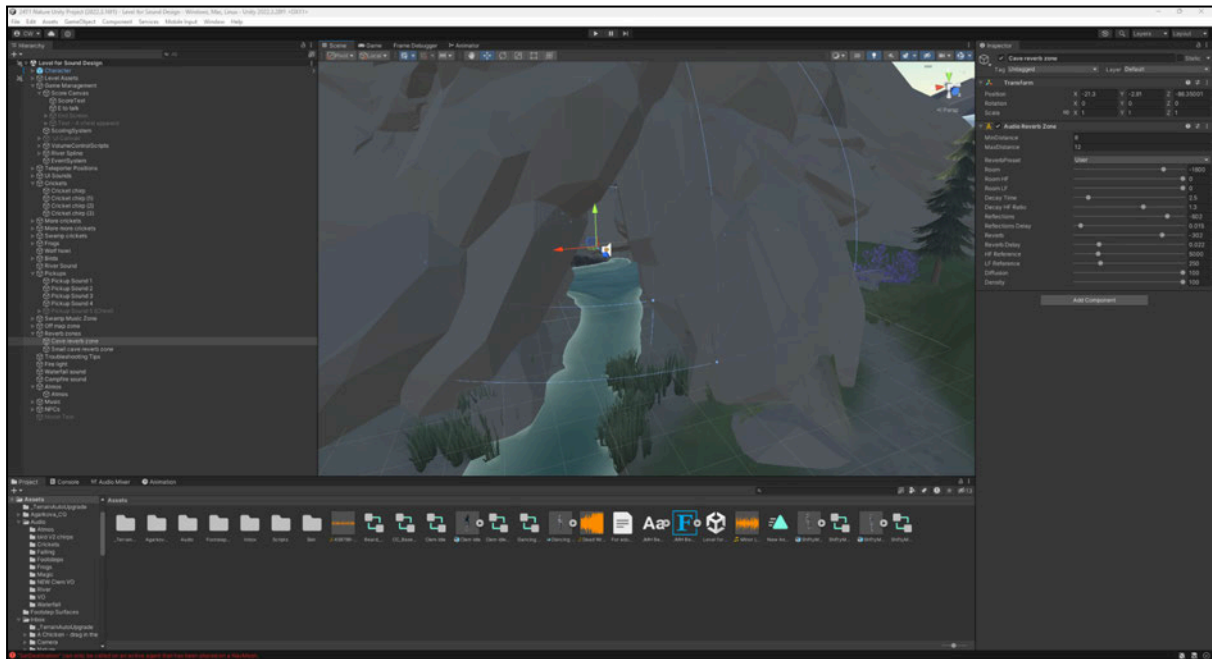
<u>Reverb Zones</u>

- The reverb zones were fairly simple. Just set them up inside each of the caves, adjusted the min and max distances and then tweaked the settings and level until it sounded natural.
- I also set the atmos to ignore the reverb zone, as it produced a slightly weird effect.
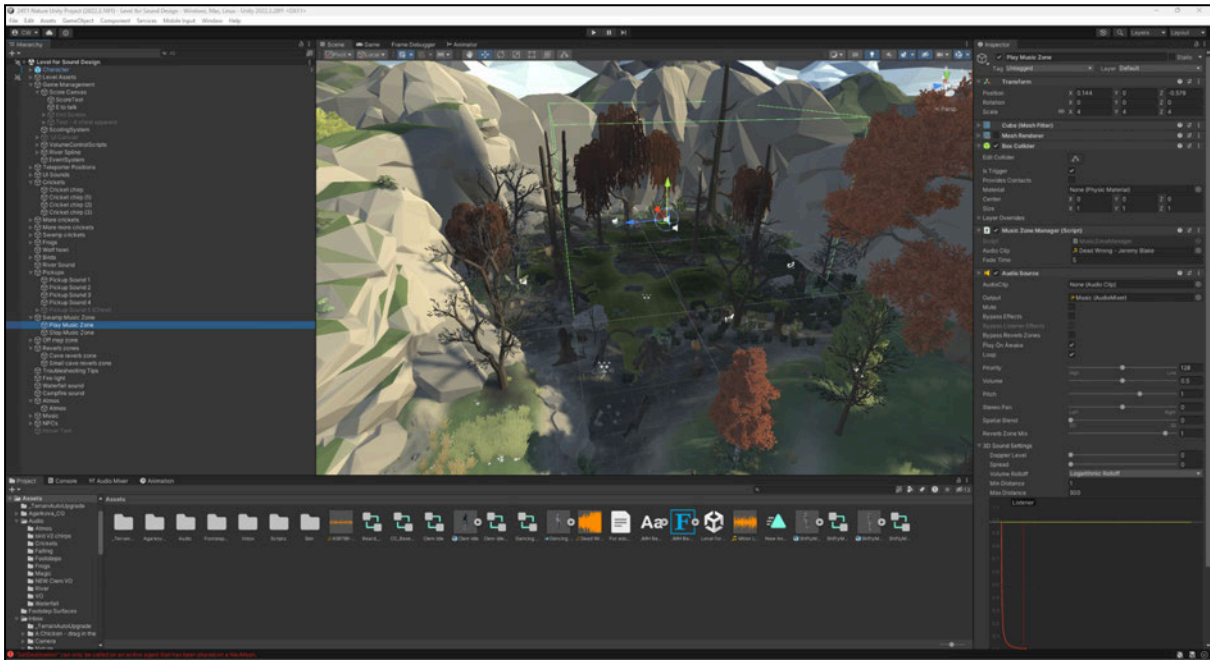
<u>Swamp</u>

- For the swamp, I used the Music zones to have the main music (which I had already chosen and implemented into the level) switch to a darker more sinister score.
- This is because the swamp is a dark and gloomy place, and I wanted to help emphasise that feeling for the player. There's definitely no other reason that the music gets dark and scary…
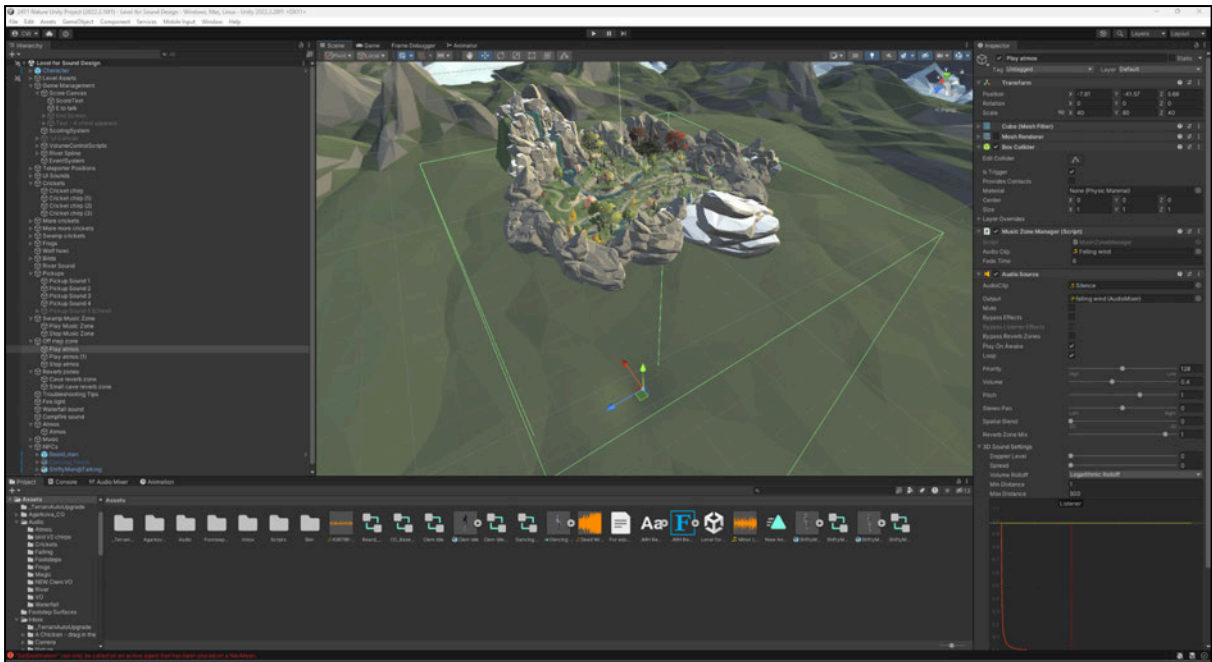
Off-map

- I wanted to make it that when the player explored too far and fell off the map, that there would be an audio accompaniment to that experience, so that it feels like it's a part of the game and that you're rewarded for exploring.
- I pretty much copied the Swamp Music Zone and made it much bigger and below the map, so when you fall off the map, it triggers the atmos to stop playing, and begins playing two different audio files (wait for demo to see what these are).
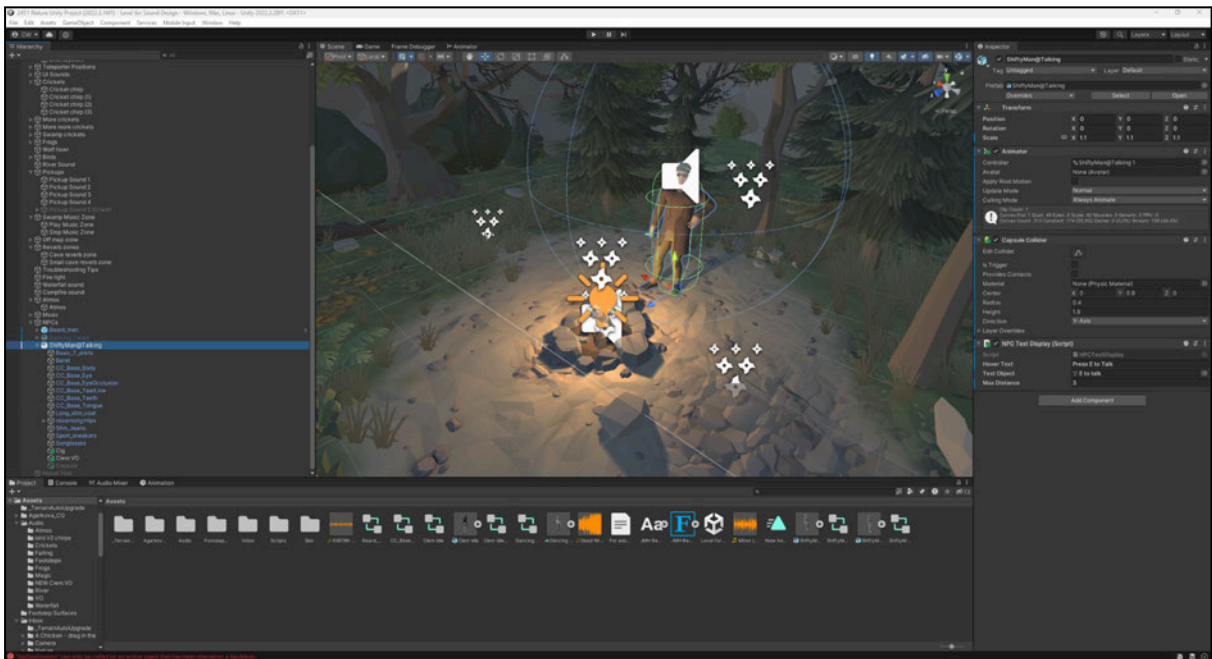
NPC

- While I was working on the level, I thought it would be fun to implement an NPC into the level that talks to you. Since I hadn't planned this originally, I ended up recording a bunch of a one liners of dialogue at home and implementing them into the game.
- I downloaded a free 3D model of a man of TurboSquid and then uploaded it to Mixamo in order to rig the model up for animations. I then chose a subtle idle animation of the character standing there, and downloaded the new model with all the animation and rigging files, and imported it into the game.
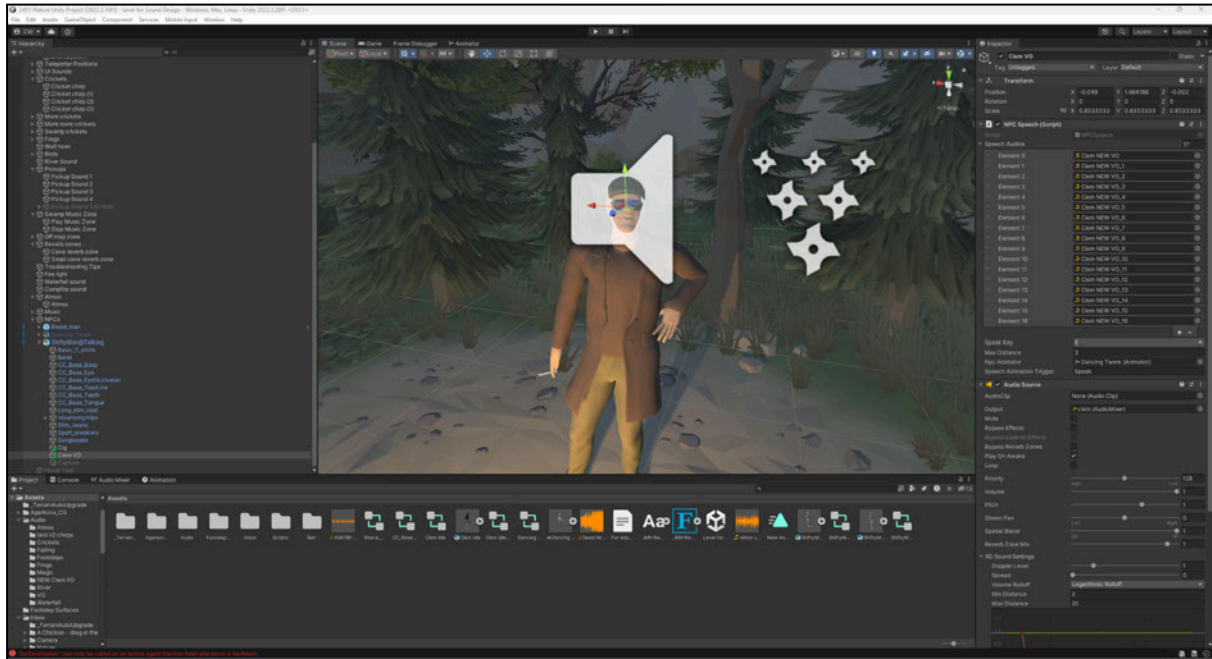
- Since I wanted to make it that your character actually has to interact with the NPC for him to speak, but I don't know anything about writing C# scripts, I used Claude AI and asked it to write a script that would play a random piece of audio from a selection of audio whenever the player pressed the E key. I also modified it so the player had to be standing near the NPC. I then also got Claude to write a script that made text appear on the screen prompting you to press E when the player hovers their mouse over the NPC.
- I then loaded in all the one liners I had recorded and it pretty much worked flawlessly. I just tweaked levels and added some subtle reverb and it was all working great. Not a necessary part of the game, and I kinda got carried away, but I thought it was cool.

Phase 4: Testing and Tweaks
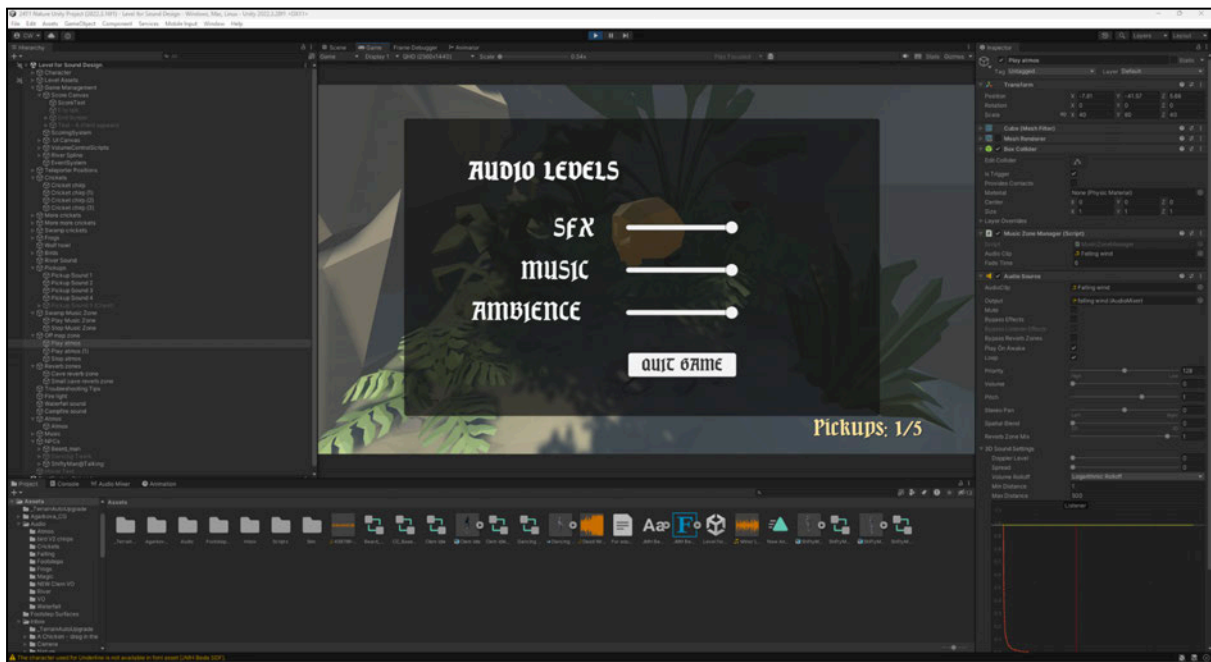
- Once all of that was implemented and working properly, I pretty much just tested and played around with the level, making small tweaks to levels in the audio mixer, adjusting locations of sound sources and other little tweaks.
- I also changed the font of the UI because I was bored.

Build & Presentation

[Presentation](#)

Mid-Project Reflection

250-words minimum.

- **Process:** *Include and discuss an interesting quote from at least one of the pre-class readings. How does this relate to your own creative practice? What are the challenges and next steps with your project work?*

Stated in the pre class reading for week 3 is: "Audio creators who work on games are game developers… We need to know the ins and outs of our games, understand how audio tells a story in a nonlinear environment, and be fluent in the other aspects of game development in order to effectively immerse ourselves in the development workflow." (Zdanowicz, G., & Bambrick, S., 2019). I feel this is a very relevant quote to this project and what we are covering in AUD216 as a whole. We're not just learning how to put sounds into a game, or how to design sounds for a game, but we're actually becoming game developers in the sense that we are becoming familiar with using game engines like Unity, and we're learning the processes and workflows that go into the entire game development process. I feel that this is quite important, as without the full context of the game development process, it is harder to design and implement audio in a way that is truly effective and immersive.

- **Person:** *How are you encouraging and helping your peers? What feedback have you collected from your peers or teacher, and how will you use it? Have you given feedback to others on their work? E.g. comments or constructive advice. Give examples.*

So far in Project 1 for AUD216, I have collaborated and shared with multiple of my classmates, having sought and given feedback on each other's sounds and ideas. There were a few ideas that I likely wouldn't have thought of without working with my other classmates, like having the player scream when falling off the map, or having the music change when entering the swamp area of the level. I feel so far the feedback has mostly been suggestions for implementing more sounds into my level, to really make the game come to life and immerse the player, which I aim to try and implement as I continue with development.

- **Proficiency:** *What are the skills, techniques, and knowledge that you have that will be useful for this project? Name some individual skills that your entrepreneur has. What might they have initially done to start developing these skills?*

So far in this project, I have been using a combination of my limited pre-existing skills and knowledge about Unity, such as navigating the UI and altering settings, as well as the new knowledge I have gained through the readings and the in class demonstrations/tutorials. I feel that having prior audio knowledge is a very important skill in audio implementation for games, so it is handy coming into this in my second year of studies. I think trying to wrap my

head around it if I was coming from a game development background rather than an audio background would be rather difficult and there would be more of a learning curve. Especially just with the general knowledge of DAWs, EQ, editing, etc. that I've already picked up in my first year of studies.

- **References:**

Zdanowicz, G., & Bambrick, S. (2019). *The Game Audio Strategy Guide: A Practical Course (1st ed.)*. Focal Press. https://doi.org/10.4324/9781351016438

Project-Completion Reflection

250-words minimum.

- **Appraisal:** *Overall, how successful was your project? What worked or didn't work, and why? Did it match your expectations? Give specific examples.*

Overall, I feel really happy with how I've done with this project. I wasn't really sure what my expectations were going into the project, but I found it really interesting from the start, and I feel that helped drive me to spend a lot of time on my game level, tweaking and fiddling with stuff for hours. I feel that my final game level came together really well, and feels mostly quite complete in terms of the soundscape. There were a few extra ideas I had in the planning phase of the project which I never ended up implementing due to time constraints, such as dripping sounds in the cave, heavier snow/wind noises in the snow sections and rustling of bushes/grass when the player walks through them. But even in spite of that, I feel really happy with my level, and quite enjoyed the challenge of implementing a talking NPC into the level.

- **Challenges:** *What obstacles did you overcome and how?*

As for challenges with this project, I feel that I somewhat struggled to find a good way to format or structure my research as I did it. I was mostly just reading through the different texts from the pre class readings and a few others, and jotting down information that I thought was important to the project. But I felt like I didn't really have a structure or an order to anything, and was kind of just taking random notes.

- **Future Goals:** *How will you improve your skills for future projects? What will you do differently in your next project? What will you repeat?*

I think for future projects, I would like to try and plan out more of a structure of research components like for this project. It would probably be more helpful to me and just generally better if I almost formatted it like a guide or like instructions, going in order from the start to the end of the game development process, and including useful tips and quotes. I think this would help me a lot more as I could refer back to it while I'm developing my game, and have the information I need, rather than having to sift through it bit by bit.

References

Zizza, K. (2023). Game Audio Fundamentals: An Introduction to the Theory, Planning, and Practice of Soundscape Creation for Games (1st ed.). Focal Press. https://doi.org/10.4324/9781003218821

Zdanowicz, G., & Bambrick, S. (2019). The Game Audio Strategy Guide: A Practical Course (1st ed.). Focal Press. https://doi.org/10.4324/9781351016438

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Somberg, G. (Ed.). (2023). Game Audio Programming 4: Principles and Practices (1st ed.). CRC Press. https://doi.org/10.1201/9781003330936\