

## **References**

### **Text**

**Buono, M., Fernandez, M., Reguero, M., Marensi, S., Santillana, S., and Mors, T.** (2016) *Ameghiniana*. 53(3): 296-315.

**Dixon, D.** (2018) *When Whales walked: and other incredible evolutionary journeys*. Quarto Publishing, London.

**Fordyce, R.** (2018) Cetacean Evolution. *Encyclopaedia of Marine Mammals*: pp180-185. Academic Press, New York.

**Gatesy, J., Geisler, J. H., Chang, J., Buell, C., Berta, A., Meredith, R. W., Springer, M. S., and McGowen, M. R.** (2013). A phylogenetic blueprint for a modern whale. *Molecular Phylogenetics and Evolution*. 66(2): 479-506.

**Hammond, P., Heinrich, S., Hooker, S., and Tyack, P.** (2017) *Whales- their past, present and future*. Natural History Museum, London.

**Marx, F. and Fordyce, R.** (2015) Baleen boom and bust a synthesis of mysticete phylogeny, diversity and disparity. *Royal Society Open Science*. 2: 140434.

**Mourlam M. and Orliac, M.** (2019) Early evolution of ossicular chain in cetacea into the middle ear gears of a semi-aquatic protocetid whale. *Royal Society Proceedings B*. 286: 20191417.

**Nummela, S., Thewissen, J., Bajpai, S., Hussain, T., and Kumar, K.** (2004) Eocene evolution of whale hearing. *Nature*. 430 (7001): 776-778

**Pajna-Underwood, S., Wilson, C., Elder, C., Mishina, Y., Lewandeski, M.** (2007) BMP signals control limb bud interdigital programmed cell death by regulating FGF signalling. *Development*. 134: 2359-2368.

**Peyenson, N., Gutstein, C., Parham J., Le Roux, J., Chavarria, C., Little, H., Metallo, A., Rossi, V., Valenzuela-Toro, A., Velez-Juarbe, J., Santelli, C., Rogers, D., Cozzuol, M., and Suarez, M.** (2014) Repeated mass strandings of Miocene Marine Mammals from Atacama region of Chile point to sudden death at sea. *Proceedings of Royal Society B*. 281: 20133316.

**Thewissen, J., Cohn, M., Stevens, L., Bajpal, S., Heyning J., and Horton W.** (2006) Developmental basis for hind-limb loss in dolphins and origin of cetacean body plan. *103(22)*: 8414-8418.

**Thewissen, J.** (2014) *The Walking Whales: from land to water in 8 million years*. University of California Press, San Francisco.

**Zimmer, C.** (1999) *At the water's edge: fish with fingers, whales with legs and how life came ashore but then went back to sea*. 2<sup>nd</sup> Ed. Touchstone Publishers, New York.

# Images (in order of appearance)

## Introduction

Wolf Footage. Author: wolfyy01. Available from: <https://pixabay.com/users/wolfyy01-12909724/?tab=videos>. [Accessed: 20.11.2019]

Right Whale Footage. Author: Videvo. Available from: <https://www.videvo.net/>. [Accessed: 20.11.2019]

## Part 1

Pakicetus 1. Available from:

<https://i.pinimg.com/originals/03/4b/c3/034bc3dd7a932f967836d63828d829fa.jpg>.

[Accessed: 21.11.2019]

Pakicetus Skeleton. Available from:

[https://live.staticflickr.com/7354/12633384233\\_fa085065b7\\_b.jpg](https://live.staticflickr.com/7354/12633384233_fa085065b7_b.jpg) [Accessed: 21.11.2019]

Pakicetus 2. Available from:

<https://images.twinkl.co.uk/tr/image/upload/illustration/pakicetus.png> [Accessed:

21.11.2019]

Inner Ear Diagram. Author: Nummela, S., Thewissen, J., Bajpai, S., Hussain, T., and Kumar, K. (2004) Eocene evolution of whale hearing. *Nature*. 430 (7001): 776-778. Available from: [https://www.researchgate.net/profile/Kishor\\_Kumar13/publication/8404089/figure/fig1/AS:279189971324938@1443575484302/Sound-transmission-mechanisms-in-land-mammals-and-whalesDiagram-of-the-ear-in-a.png](https://www.researchgate.net/profile/Kishor_Kumar13/publication/8404089/figure/fig1/AS:279189971324938@1443575484302/Sound-transmission-mechanisms-in-land-mammals-and-whalesDiagram-of-the-ear-in-a.png). [Accessed: 23.11.2019]

Malleus, Incus and Stapes Diagrams. Author: Mourlam M. and Orliac, M. (2019) Early evolution of ossicular chain in cetacea into the middle ear gears of a semi-aquatic protocetid whale. *Royal Society Proceedings B*. 286: 20191417. [Accessed: 19.11.2019]

Embryo Image. Available at:

<http://classconnection.s3.amazonaws.com/519/flashcards/2297519/png/untitled1354144328425.png>. [Accessed: 29.11.2019]

## Part 2

Drawings of Pakicetus, Indohyus, Ambulocetus, Remingtonocetus, Georgiacetus, Durodon, Janjucetus and Aetiocetus. Author and Available at: **Gatesy, J., Geisler, J. H., Chang, J., Buell, C., Berta, A., Meredith, R. W., Springer, M. S., and McGowen, M. R.** (2013). A phylogenetic blueprint for a modern whale. *Molecular Phylogenetics and Evolution*. 66(2): 479-506. [Accessed: 01.12.2019]

Ambulocetus Skeleton. Author: Rushelle Kucala. Available from: [http://orig08.deviantart.net/bd8e/f/2017/191/5/2/2ambulocetusskeleton\\_by\\_thedragonofdooom-dbft4kl.jpg](http://orig08.deviantart.net/bd8e/f/2017/191/5/2/2ambulocetusskeleton_by_thedragonofdooom-dbft4kl.jpg) [Accessed: 01.12.2019]

Ambulocetus Flesh. Author: Rushelle Kucala. Available from: <https://images-wixmp-ed30a86b8c4ca887773594c2.wixmp.com/f/5ac41d41-f681-45c9-a7ca-86fecac6df8f/dbn7i7t-65a1424d-73fd-44a7-ac6d-973b609aa7ae.jpg?token=eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9.eyJzdWUiOiI1cm46YXBwOjdlMGQxODg5ODIyNjQzNzNhNWYwZDQxNWVhMGQyNmUwIiwiaXNzIjojdXJlOmFwcDo3ZTBkMTg4OTgyMjY0MzY0YTVmMGQ0MTY0YTBkMjZlMCIslm9iail6W1t7InBhdGgiOiJcL2ZcLzVhYzQxZDQxLWY2ODEtNDVjOS1hN2NhLTg2ZmVjYWM2ZGY4ZlwwZGJuN2k3dC02NWExNDI0ZC03M2ZkLTQ0YTctYWM2ZC05NzNiNjA5YWE3YWUuanBnIn1dXSwiYXVkljpbInVybjpzZXJ2aWNlOmZpbgUuZG93bmXvYWQixX0.er7xo72ECm--UubnlbNGLDk0oKA8PKUhd105Q4u4OXM> [Accessed: 01.12.2019]

6ft Darwin Sillhouette. Available from: [https://upload.wikimedia.org/wikipedia/commons/thumb/8/80/Ambulocetus\\_size.png/1280px-Ambulocetus\\_size.png](https://upload.wikimedia.org/wikipedia/commons/thumb/8/80/Ambulocetus_size.png/1280px-Ambulocetus_size.png) [Accessed: 01.12.2019]

Skeletal Hand. Available from: <https://s-media-cache-ak0.pinimg.com/originals/c7/45/d7/c745d77fac57e629fd7216ef74bec0d6.jpg> [Accessed: 01.12.2019]

Humpback/Limb demonstration. Available from: <http://yesofcorsa.com/wp-content/uploads/2017/06/Humpback-Whale-Best-Wallpaper.jpg> [Accessed: 01.12.2019]

Skeletal Cetacean Limb. Available from: [https://dr282zn36sxxg.cloudfront.net/datastreams/f-d%3Ab6168f8dc65cee87596441bed12d51a0297a60743aa3c835a170b909%2BIMAGE\\_TINY%2BIMAGE\\_TINY.1](https://dr282zn36sxxg.cloudfront.net/datastreams/f-d%3Ab6168f8dc65cee87596441bed12d51a0297a60743aa3c835a170b909%2BIMAGE_TINY%2BIMAGE_TINY.1) [Accessed: 01.12.2019]

Spotted Dolphin Foetus. Author: **Thewissen, J., Cohn, M., Stevens, L., Bajjal, S., Heyning J., and Horton W.** (2006) Developmental basis for hind-limb loss in dolphins and origin of cetacean body plan. 103(22): 8414-8418. Available at: [http://www.edwardtbabinski.us/whales/hind\\_limb\\_buds/embryo\\_labeled.jpg](http://www.edwardtbabinski.us/whales/hind_limb_buds/embryo_labeled.jpg) [Accessed: 29.11.2019]

### Part 3

Phylogentoc tree - Gatesy et al., phylogenetic blueprint for a whale

Phylogenetic Tree of Cetceans. Author and Available at: **Gatesy, J., Geisler, J. H., Chang, J., Buell, C., Berta, A., Meredith, R. W., Springer, M. S., and McGowen, M. R.** (2013). A phylogenetic blueprint for a modern whale. *Molecular Phylogenetics and Evolution*. 66(2): 479-506. [Accessed: 01.12.2019]

Durodon Skeleton. Author: Rushelle Kucala. Available from: <http://images.contentful.com/yet7mgppcdzv/11labRpdsiGISmCY2oEEOQ/7a5968f6f50daf76b25dfb6c5e76d61/art040.jpg> [Accessed: 02.12.2019]

Basilosaurus Skeleton. Author: Rushelle Kucala. Available from: <https://images.ctfassets.net/yet7mgppcdzv/3lAts1pl9W2aywWoQWYUEm/34daf964593ebf015935ee32338ca246/art041.jpg> [Accessed: 02.12.2019]

Basilosaurus Flesh. Author: Rushelle Kucala. Available from: <https://images-wixmp-ed30a86b8c4ca887773594c2.wixmp.com/intermediary/f/5ac41d41-f681-45c9-a7ca-86fecac6df8f/dbrhx2w-95b71122-c177-4dff-ab55-b08c2c83e3e5.jpg> [Accessed: 30.11.2019]

Neocetacean Phylogeny. Author and Available from: **Marx, F. and Fordyce, R.** (2015) Baleen boom and bust a synthesis of mysticete phylogeny, diversity and disparity. *Royal Society Open Science*. 2: 140434. [ Accessed: 02.12.2019]

Tokaharia. Available from: [http://img05.deviantart.net/ad72/i/2016/028/c/4/another\\_maori\\_surfboard\\_head\\_by\\_dont\\_knowwhattodraw94-d9pncbg.png](http://img05.deviantart.net/ad72/i/2016/028/c/4/another_maori_surfboard_head_by_dont_knowwhattodraw94-d9pncbg.png) [Accessed: 01.12.2019]

Humpback 2. Available from: <http://ourmarinespecies.com/wp-content/uploads/2018/04/humpback-whales-1.jpg> [Accessed: 02.12.2019]

Blue Whale and Diver. Available from: [http://res.cloudinary.com/dk-find-out/image/upload/q\\_80,w\\_1440/MA\\_00925211\\_gwnvzd.jpg](http://res.cloudinary.com/dk-find-out/image/upload/q_80,w_1440/MA_00925211_gwnvzd.jpg) [Accessed: 02.12.2019]

Right Whale. Author: Videvo. Available from: <https://www.videvo.net/> [Accessed: 30.11.2019]

### Credits:

NHM Logo. Author: Natural History Museum. Available from: <https://1000logos.net/wp-content/uploads/2018/01/Natural-History-Museum-Symbol.jpg> [Accessed: 03.12.2019]

**Additional Thanks:**

**Camera Operator:**

Curtis Kenneavy

**Music**

Fiona Taylor

Living by Water

**Additional Thanks to:**

Ellen Coombs (for allowing us into the museum to film)

Natural History Museum, London